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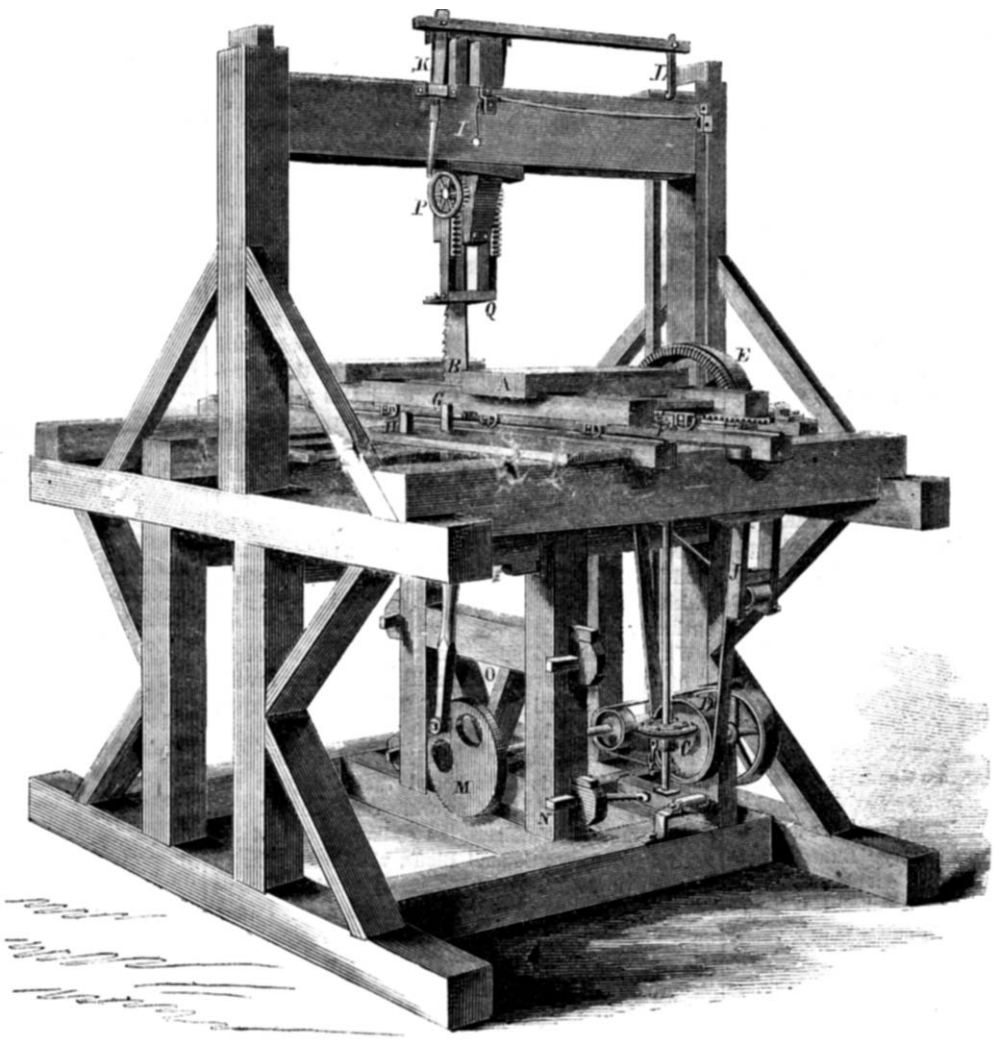
Improved Saw-mill.

Very great advantages have ensued from dispensing with the heavy and cumbrous sash or slide formerly used in saw-mills, and substituting therefor light but rigid guides, which answer the same purpose, but do not require a tithe of the power to stop and start them from a state of rest that the sash did.

This saw-mill is exceedingly well designed in its several parts, and, at the same time, it is as simple and free from complexity in its details as such machinery can be. By examining the engraving it will be seen that it is substantial and conveniently arranged for access; every detail can be inspected or adjusted as required, with little trouble or waste of time. The details of the mill are as follows:—The timber to be cut is placed on the carriage, A, which receives a regular and gradual feed or advancing motion toward the saw, B, by means of gearing. This gearing consists of a friction wheel, C, below the frame, and the driver, D; the friction-wheel shaft has a small pinion on the which is hidden by the frame. This pinion gears into the belt wheel, E, by the teeth on its edge, and thus (through the agency of another pinion, F,) advances the carriage in the manner previously described. After the saw has finished one cut the carriage is "gigged" back by throwing the friction wheeel out of gear with its driver. This is done by moving the lever, G, which releases a catch, H, that held the pinion on the friction shaft in gear with the large wheel, and throws the pinion clear of the teeth in it. By grasping the cord, I, the idler pulley, J, is thrown into contact with the belt, forcing it to hug the wheel, E, and thus return the carriage rapidly in the contrary direction from that in which the feed gear moved it.



GIBBS'S SAW-MILL.

The amount of feed is varied by moving the friction wheel up on its shaft, so as to be nearer to, or farther from, the center of the driver. This movement is accomplished by the rods, K and L. This latter rigging is always within reach of the sawyer, and can be adjusted instantly. The black edge on the friction wheel in the engraving indicates a band of rubber, which is confined by disks of metal, thus obtaining a friction wheel which is certain to adhere under all ordinary circumstances.

The crank shaft, or wheel, M, can be adjusted laterally and vertically by keys, N, in the timbers on which the bearings are placed, and the main bearing is further strongly braced by the timber, O, above it. The crosshead is guided at the bottom by bars, which are not shown, and at the upper end by other guides—the back of which only appear. Both of these crossheads are simply constructed to avoid excessive friction and weight on the guides under the rapid motion they are subjected to. The gearing, P, on the upper part of the frame serves to adjust the foot, Q, by which the timber is held down when being cut. These several parts thus arranged are, as we have said, well adapted for their work, and are free from the objections which attach to complex saw mills.

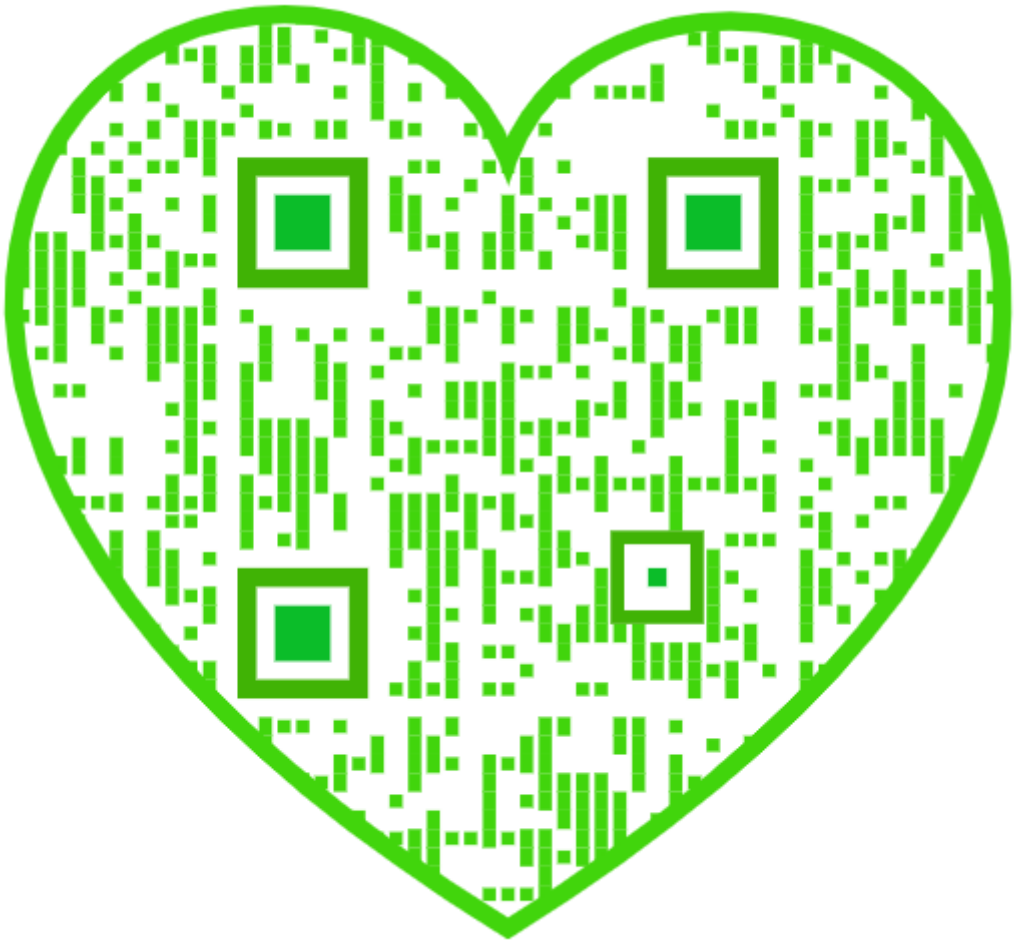
The invention was patented on the 12th of May, 1863, by D. C Gibbs, of Fleetville, Pa.; address him at that place for further information.

Laying the Atlantic Telegraph Cable.

The London *Times*, of June 30th, says:—"Since the *Great Eastern* has been moved from Sheerness, all the final arrangements for her great undertaking have been pushed forward to the utmost, and in the course of another few days she will be in a condition to start, though it is not probable that she will really move to sea before the 9th or 10th of July. She is now anchored in the channel, about seven miles below the Nore, swinging freely to the wind and tide, held only by a single six-tun Trotman anchor, and having a minimum depth of eight fathems under her at low water. Since she has been moved from her old berth in the Medway the work of coaling her to the utmost has been steadily going forward. Half of her extra supply of 1,500 tuns is already aboard, and the rest will be stowed away by the end of next week. With all her weights she will then draw a little over 33½ feet, though with 24,000 tuns on board.

"Mr. Glasse starts with the massive shore end for Ireland early next week. This enormous solid portion of the cable goes in a special vessel, and will be submerged from Valentia to a distance of twenty-five miles from the shore on the 10th. The end at sea will be buoyed to await the *Great Eastern's* arrival; that on shore will be put in communication with the wires of the International and Magnetic Companies, which already give free communication to Valentia. When the *Great Eastern* arrives and the splice is completed her voyage will instantly commence; a line steamer—the *Hawk*—accompanying her for a distance of some thirty or forty miles. In this steamer will be the directors of the company and a few invited guests, but absolutely none not connected with laying the cable will be allowed on board the *Great Eastern*. Twice a day, in the morning and in the evening, signals will be sent from the ship to Valentia, stating where the vessel is, etc., and these will be regularly transmitted direct to London. Anything, therefore, occurring on board the ship will be instantly known in England, while, on the other hand, anything going wrong with the cable itself, will be as quickly ascertained—not alone from the cessation of signals, but from the tests that can be applied to the end at Valentia.

"The paying-out machine is being fixed upon board the ship, and the leading trough has also been completed along the deck. This latter is a plain timber frame, supporting a semi-circular trough of iron, down which the cable is drawn to the paying-out machine, the friction of its passage sufficing to keep it 'taut,' and obviate all chances of 'kinks' entering the machine. All three tanks containing the cable have now been completely filled with water, and the wire, in fact, is as much submerged now as it will be at the bottom of the Atlantic—with this difference, that the pressure of the immense depths of the ocean will materially improve the condition of the cable by the compression of the gutta-percha. In these three tanks the temperature and quantity of water are kept precisely equal, and a series of electrical tests have been taken for the last three days, and will be continued for five days more, in order,



from the results of all, to obtain a standard of what the condition of the cable should be while paying out. The contents of the three tanks—that is, the entire length of 2,500 miles of cable, have now been coupled up, and signals are sent through morning and evening.

NOTES ON NEW DISCOVERIES AND NEW APPLICATIONS OF SCIENCE.

SUBSTITUTION OF MAGNESIA FOR LIME IN THE OXY-HYDROGEN FLAME.

The light emitted by the metal magnesium, in undergoing combustion, is due solely to particles of the magnesia, or oxide of magnesium, which is formed by the combination of the metal with the oxygen of the air, being raised to an exceedingly high temperature by the enormous heat developed during that combination. Pondering this fact, a French chemist, M. Carlevaris, was led to conceive the idea of obtaining the same light, so valuable for its great actinic power, by heating magnesia in the oxy-hydrogen flame, just as lime is heated in the case of the lime-light, and so without the intervention of metallic magnesium. His method is to place in the flame a piece of chloride of magnesium, fixed to a support of retort carbon. The chloride decomposes, its chlorine flying off and being replaced by oxygen; the oxide thus formed remaining as a spongy but coherent mass, of the same shape as the original piece of chloride. By this arrangement it is said that M. Carlevaris obtains a light possessing in all respects the same properties as that obtained by burning metallic magnesium. His method has one advantage over that of obtaining the light directly from the metal, being free from the only inconvenience which attends the latter method, the inconvenience due to a large part of the magnesia produced by the combustion of magnesium being thrown off as an infinitesimally fine powder, or dust, which soon pervades the whole atmosphere of the room in which the magnesium is being burnt, and renders it exceedingly unpleasant. On the other hand, M. Carlevaris's method requires the generation of oxygen and hydrogen, and involves the use of bulky reservoirs in which to contain these gases, and a complicated apparatus for applying them. The materials for the production of the light by his method cannot be carried in a waistcoat pocket, as magnesium-wire enough to burn for twenty-four hours can. To which method the *balance* of advantages belongs, however, can only be decided by experience. It may be that it lies with neither, absolutely, but that one method may be the best adapted for some purposes, while for other purposes the other may be the most suitable.

IMPROVED BATTERY.

The numerous efforts which are being made towards the attainment of a cheap means of procuring electricity are certainly leading to valuable results. A very promising new form of battery was described in these "Notes" only last week, and now we have to speak of still another. In an ordinary "Bunsen's battery," as the reader is aware, each couple consists of a hollow cylinder of carbon and a cylindrical bar of amalgamated zinc. The latter is enclosed in a vessel of porous earthen-ware, containing dilute sulphuric acid, and this vessel is placed within the hollow cylinder of carbon, the whole being enclosed in a glass or other vessel containing nitric acid. Some little time ago M. Duchemin discovered that the nitric acid in this battery might be replaced by a solution of perchloride of iron, and the sulphuric acid by a solution of chloride of sodium, or common salt, with great advantages as regards both cost, convenience, and constancy, and he has just announced to the Academy of Sciences that he finds that still better results are obtainable by the use of chloride of potassium instead of sodium chloride. This substitution does not appreciably increase the cost of working the battery, while it greatly increases its electro-motive force.

OXYGEN FROM AIR AND WATER.

M. Tellier, with whose ammonia engine our readers are already acquainted, is a gentleman with a genius for original conceptions lacking neither in boldness nor in ingenuity. His latest proposal is to use *iron* as *fuel*, for a purpose to which we shall refer on another occasion burning the iron in pure oxygen, obtained, by a very novel and ingenious process, from the atmosphere. If you pass a mixture of hydrochloric acid gas and atmospheric air over pummice heated to redness, in a suitable apparatus, the hydrochloric acid will be decomposed, its hydrogen uniting with the oxygen of the air, to form water, and its chlorine being set free. There will thus issue from the apparatus, instead of the mixture of hydrochloric acid and air which entered it, a mixture of steam, chlorine, and nitrogen. On the other hand, if you pass a mixture of free chlorine and steam through a red hot tube, the chlorine will decompose the steam, combining with its hydrogen to form hydrochloric acid, so that what will issue from the tube will be a mixture of hydrochloric acid gas and free oxygen,—the constituents of this mixture being easily separable. M. Tellier proposes to obtain oxygen by forming a circuit in which two sets of reactions should go on continually. First, hydrochloric acid should be made to decompose steam. The reaction between the chlorine and the steam would yield, as we have seen, not only free oxygen, but also hydrochloric acid, with which to repeat the process, so that the same chlorine could be used over and over again, *ad infinitum*, the only materials employed in the process fresh supplies of which would be required for each repetition of it being those two exceedingly cheap ones, air and water. The cost of oxygen obtained by this method would thus be simply that of fuel and wear and tear of apparatus, *plus* that of separating the nitrogen from the triple mixture obtained as the result of the first reaction. We do not see how this nitrogen is to be removed, but M. Tellier says that he does; and if he really can overcome that difficulty there can be no question but that he has solved the problem of how to obtain cheap oxygen.—*Mechanics' Magazine.*

THE PACIFIC RAILROAD.

This is now one of the most urgent needs of the nation. Capital has been to a great extent thrown out of its recent channels, and become stagnated by the sudden cessation of the war. Its most natural and useful employment would be found in opening and developing the vast mineral resources of the mountain regions of the West. But until this railroad is built, it is plain to every practical man that most of the mining schemes, so plentifully projected, are sure to be unprofitable. Expenses of transportation and subsistence eat up all the income of enterprises sincerely pursued; while empty speculation, building its silver and golden fancies in the clouds, absorbs in profitless interchange of worthless stock, the money which ought to be swelling the stream of legitimate business.

With the railroad built, however, capital would be at no loss to discover opportunities for paying investment in the actual working of mines, not on paper, but in the all-producing earth.

So much would such a result redound to the general good, that it is to be hoped that Congress will lend all possible aid to the work. One hundred and sixteen millions of dollars, the estimated cost of the central route from Council Bluffs, via. South Pass to Benicia, (a distance of 2,032 miles) would soon be repaid by the road to the nation in more ways than one.

First, in the way already suggested, of increasing the production of wealth.

Second, in the increased income of the government, derived from that increasing wealth.

Third, the decrease of government expenses for transportation of mails, troops, etc., and for subsistence of troops in remote regions.

Fourth, as a means of national defence in case of foreign war, it would pay its cost in a single year; and as a security against such a war, and as an additional bond of unity between East and West, its ounce of prevention outweighs the pound of cure.

Fifth, the rapid accumulation of specie consequent upon the completion of such a road would soon make a California of the whole nation; and even the anticipation of such a result would enable the government to resume a specie basis of finance at an earlier period, thereby saving both government and people a large percentage of present outlays.

These considerations, involving both the national defense and the general welfare, seem to make the completion of at least one through trunk line, a duty, as well as a privilege of the general government. There is but little doubt that the people at large clearly recognize the common interest in the matter, and are unanimously minded to have the Pacific Railroad built in the quickest possible way. They perceive the propriety of a common contribution of expense where the benefit is common, without quibbling about its exact distribution, which is impossible. Especially so in a work like this, so vast that private enterprise cannot grapple with it, and would accomplish it, if at all, only by piecemeal, nibbling its way along as it felt itself supported or impelled by the oncoming tide of population. It is doubtful whether indeed private enterprise would ever get through with it. The vast tracts of unarable land on these routes seem to make the work impossible except as a public one.

On this central route, above mentioned, there are estimated to be only 632 miles of arable land to 1,400 miles not capable of cultivation, about 31 per cent. On the great Northern route, from St. Paul's to Puget's Sound, the proportion is 535 miles arable out of 2,025 miles, total, about 26½ per cent. On the coast route near the 32d parallel, from Fulton to San Francisco, only 834 out of 2,034 miles are arable. This last is the largest proportion on any practicable route, being about 41¼ per cent.

In this view of the subject it would seem that Providence had veined and crypted these mountain regions with the precious metals in order to insure the coming together of the people from East and West, and the consequent unity of the nation forever. It has thus made a bridge of what promised to be an inseparable barrier. And where a heaven-high wall of ice-crowned rock seemed to mark a natural boundary between two peoples, silver gates have opened and the East and West have met in chambers of gold.

For thus it is this road must be built, in two sections prosecuted simultaneously from the East and from the West. The two parts coming from either side to the great barrier ridges, will there tap the golden current, the outflow of which will give them vitality to toil on and overcome the mountains, till at last united in one great trunk line. This being completed, it would be more natural and easy to run branch lines north and south over the valley routes than to construct other trunk roads across the heavy mountain ridges. Such branch lines would quickly and efficiently develop the country, and it is therefore doubtful whether more than one trunk road can or ought soon to be built. The southern route seems quite feasable; but for this species of development it is evidently insufficient; and other routes would still be required. The central route, having medium difficulties to overcome, presents the most obvious advantages for the speedy development of the country. And its great present advantage is this one adverted to, of striking the gold and silver regions as a sort of midway house on either half of the route in the Pike's Peak region on the eastern half, and in the Sierra Nevada on the western portion. While its solitary middle way through the deserts of Utah is cheered by the oasis of Salt Lake City. Here meeting in the mountain-hedged valleys, the two currents from the East and West will spread out over regions otherwise to be long uninhabited; and that apparantly barren and inaccessible region will become eventually the seat of empire, as it is the rocky summit of the continent.

Thus the future throne of America is literally one of native silver; and the golden scepter which God hath given her, she shall wield sitting above the clouds.

A New Horse Nail Machine.

We recently had the pleasure of seeing a new machine for making horse nails in successful operation at Messrs. Taylor's machine shop in this city. Little attendance is required, it being merely necessary to heat the rods in a furnace by the machine and put them in a carriage; the rods are then fed in and the nails are turned out at the bottom very rapidly. This machine makes hammered nails not rolled ones, and the quality of them appears to be excellent. See advertisement on another page—of Foreign Patents for sale.

WE are indebted to the Hon. D. P. Holloway, Commissioner of Patents, for copies of the Patent Office Report for 1862. We hope soon to receive the Report for 1863.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Lamp-wick Trimmer.—The object of this invention is to produce a simple and easily-operated instrument for trimming the wicks of kerosene and other lamps. It consists in arranging in a suitable guiding frame, a cutter or cutting blade, in such manner that it may be operated by pressing together, by the hand, the levers of the device. The cutter slides in a guide way, and is so arranged that its edge does not work against a fixed block or plate, but upon a fixed cutting blade, which greatly facilitates the cutting operation, as well as preserves the edge of the cutter for a much longer time than if it were arranged otherwise. The wick of the lamp is placed between the sliding cutter and fixed cutting blade, and the former is forced forward by the levers, when it will be found that an even cutting of the wick is produced, which causes the wick to burn with a more even flame and give a better light, than were a jagged cut made, which usually occurs when a pair of scissors are employed. This device will be found a very convenient and useful article, and the ease and accuracy with which it performs its work, recommend it to all persons using coal oil or other lamps. The inventor of the above device is Cyrus L. Topliff, of No. 37 Park Row, New York, who may be addressed for further information.

Turbine Water Wheel.—This invention relates to improvements on the jonval turbine, in substituting the helix in place of a large iron case or wood firebag, and so constructing it as to reduce the friction of the water in passing through it to its minimum effect, the water leaving the buckets of the wheel with its full force or power. Also constructing the wheel in such a manner that the water, in passing through the buckets leaves them in its natural course and direction, giving to the wheel a strong and steady motion that is not easily affected by throwing on and off machinery, simplifying and adapting it to all mills where a first-class motion is wanted, and so arranging all its parts that there is no ross of power from continued use, The inventor of the above is J. E. Stevenson, 200 Broadway, New York. It was illustrated in No. 8, Vol. XII.

Pump for Oil and Other Wells.——This improvement in pumps is especially designed for deep wells, such as oil and other artesian wells, and it embraces several novel features, one of which is confining a piston in the cylinder of a pump by means of a detachable collar, which is fastened in place and unfastened automatically by means of the piston rod, without requiring the removal of the pump cylinder; another is inclosing the working cylinder within an annular valve chamber through which the liquid to be pumped is brought up into that part of the cylinder which is above the piston; another is a novel construction of piston, whereby its lower valve is relieved of the load of the column above it. Aaron Carver, of Little Falls, N. Y., is the inventor.

Metallic Journal and Stuffing Box.—This invention consists in a conical box with a follower in combination with a sectional or split lining and key, made tapering to correspond to the shape of the box and lining, and also adjustable by a set screw or other equivalent means, in such a manner that, by the action of the follower, the lining can be depressed and set up against the rod or shaft passing through the box, and by the key the pressure of the lining on said shaft or rod can be regulated and adjusted with the greatest ease and facility. This box is applicable to piston rods of steam engines or to rods of any other description, which have to pass air or steam tight through a stuffing box, such as valve rods, pump rods, etc. For further information as to shop, county or State rights, etc., address the inventor, H. L. Hopkins, San Francisco, Cal.

Distilling Apparatus.—This invention relates to an apparatus which is particularly intended for the manufacture of aniline, but which can be used with advantage for distilling a great many other materials or substances besides aniline. It consists in a series of hollow drums connected with each other by means of oblique pipes and secured to a shaft, one end of which is hollow and stationary, and connects with a vertical branch pipe, in combination with or without a jacket or boiler, in such a manner that when said drums are partially filled with the liquid to be distilled, and the apparatus is rotated while being exposed to heat, the oblique pipes cause a violent agitation of the liquid to be distilled, and the distillation is materially facilitated, the gaseous products which escape from the liquid being allowed to pass off freely through the vertical branch pipe and the hollow end of the shaft. Carlos F. Frederici, 82 Wall street, is the inventor.

FARMERS' CLUB.

The Farmers' Club of the American Institute held its regular weekly meeting at its room at the Cooper Institute, on Tuesday afternoon, July 11, the President, N. C. Ely, Esq , in the chair.

THE BEST FRUIT GARDEN IN AMERICA.

Mr. Carpenter:—Mr. Chairman, I have just made a visit to the finest fruit garden in this country, if not in the world—that of Mr. Charles Downing, of Newburgh, in this State. It is of only seven acres in extent, but it contains the greatest variety of choice fruits that I know of anywhere. Mr. Downing is very moderate in his assertions, but he remarked that he has over one thousand varieties of apples and pears. He has also all the European and native varieties of raspberries; and among them all he regards Brinkel's Orange as the best. He has one variety of currant, single berries of which have measured, I am certain $2\frac{1}{2}$ inches, and I believe $2\frac{3}{4}$ inches in circumference.

Mr. Bartlett :—I would call Mr. Carpenter's attention to the fact, that this would make the berries nearly an inch—more than three-quarters of an inch —in diameter.

Mr. Carpenter:—Yes; I understand it.

THE BEST CURRANT.

Mr. Williams presented specimens of three varieties of currants—Prince Albert, Cherry and Versailles, and remarked that he brought them expressly for Mr. Robinson, to see the difference between the Cherry and the Versailles, as Mr. Robinson had remarked that he had both varieties and nobody could tell the difference between them.

Mr. Robinson, after trying the two, said that he was satisfied that both of his were one variety—the Versailles.

Mr. Carpenter, Mr. Williams, and other fruit growers, congratulated him on having the best known variety of currant; and the gentlemen present being invited to taste the three varieties, unanimously pronounced the Versailles to be the best.

THE WAY TO TRANSPLANT TREES LATE.

Mr. Carpenter gave the result of his experience in transplanting trees late in the season, and stated that that if the new wood and all the leaves are removed, trees will bear transplanting after the new wood has grown three or four inches.

OSAGE ORANGE HEDGES.

Solon Robinson read a communication from a correspondent of the Club in Missouri, saying that the osage orange, when planted for hedges, should not be cut back, but the plants should be braided together, bending them all one way the first year and the opposite the second year—thus alternating annually.

RED RASPBERRIES INDIGESTIBLE.

Mr. Bartlett :—Mr. Chairman, I should like to ask the Club if the red raspberry is generally indigestible. I find it in my own case different in this respect from all other fruit.

Solon Robinson:—It is the same in my case.

Mr. Carter :—The same with me; I cannot eat them.

Several other subjects were discussed, but the above were of the most interest.

THE *Commercial and Financial Chronicle, Bankers' Gazette, Commercial Times, Railway Monitor and Insurance Journal* is the heading of a new weekly paper representing the industrial and commercial interests of the United States. Each number contains thirty-two pages, modeled after the celebrated London *Economist.* It is a valuable journal for bankers, merchants, underwriters, stock jobbers and commercial men, and, we are pleased to see, sound in its political economy. Terms, $10 per annum. Published by William B. Dana & Co., No. 60 William street.

DESTRUCTION OF BARNUM'S MUSEUM

At noon on the 13th inst., that old and familiar place of amusement known as Barnum's Museum caught fire and was totally destroyed, with all its contents. The origin of the fire is not known, but it is said was first discovered about the boiler in the basement. A large number of visiters were in the building at the time but they all escaped without injury, as did also the several celebrities employed in the building. Of all the animals the learned seal and a bear alone escaped. The museum contained a great many rare minerals, coins and suits of ancient armor which were interesting to students and others; also innumerable trifles of all descriptions which can never be replaced.

Mr. Barnum lost $300,000, and was insured for $60,000, in several companies, and we doubt not that through his well known energy and sagacity a new Museum will arise from the ashes of the old one wherein the giants may stalk as of old and the moral drama flourish exceedingly.

Several other buildings were also consumed with the Museum and at one time the fire threatened to spread over a large area.

MISCELLANEOUS SUMMARY.

TURPENTINE.—Preparations are making, says the Wilmington (N. C.) *Herald,* in the different parts of the adjoining country for the manufacture of turpentine as rapidly as circumstances will admit. Numbers in the upper counties from this have been engaged for some time in rebuilding the works destroyed during the war, while many others are about commencing the work. The work will go on in good earnest when the farmers can leave their growing crops, which will be in a few weeks.

A GANG of burglars, some of them from London and others from Liverpool, have been arrested in Birmingham. They had a good stock of tools, including a newly-invented machine for destroying the locks of safes. The article is composed of several pieces of steel so securely joined, and fitted with such powerful penetrating blades of steel, that it is thought capable of gradually forcing any number of safes.

WATER-PROOF PAPER.—A fluid for rendering paper water-proof may be made by dissolving $1\frac{3}{4}$ ounces of pure tallow soap in water, then adding a solution of alum in quantity sufficient for the complete decomposition of the soap.—This fluid ought to be mixed with the paper pulp, which may be worked up in the usual manner, but needs no glueing.—*American Druggist.*

THE NATION is the title of a new weekly political and literary journal, the first number of which has made its appearance. It has a very solid appearance, and promises to take high rank with those who enjoy sound and able discussion of those great events in the political world which are now passing in review It is published weekly by J. H. Richards, No. 130 Nassau street. Terms, $3 per annum.

METHYLATED spirits or wood naphtha is not yet manufactured to a great extent in this country. It has most of the properties of alcohol, and for certain purposes it is a complete substitute.

COATING SHIPS' BOTTOMS.—Dr. H. De Briou, England, proposes a compound of 250 parts vulcanized India-rubber and 750 mineral pitch, to be applied hot, and like tar, for the coating of ships' bottoms.

THE Wallingford, Conn., community report the gathering this season of 850 bushels of strawberries from five acres of plants, being an average of 170 bushels per acre.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

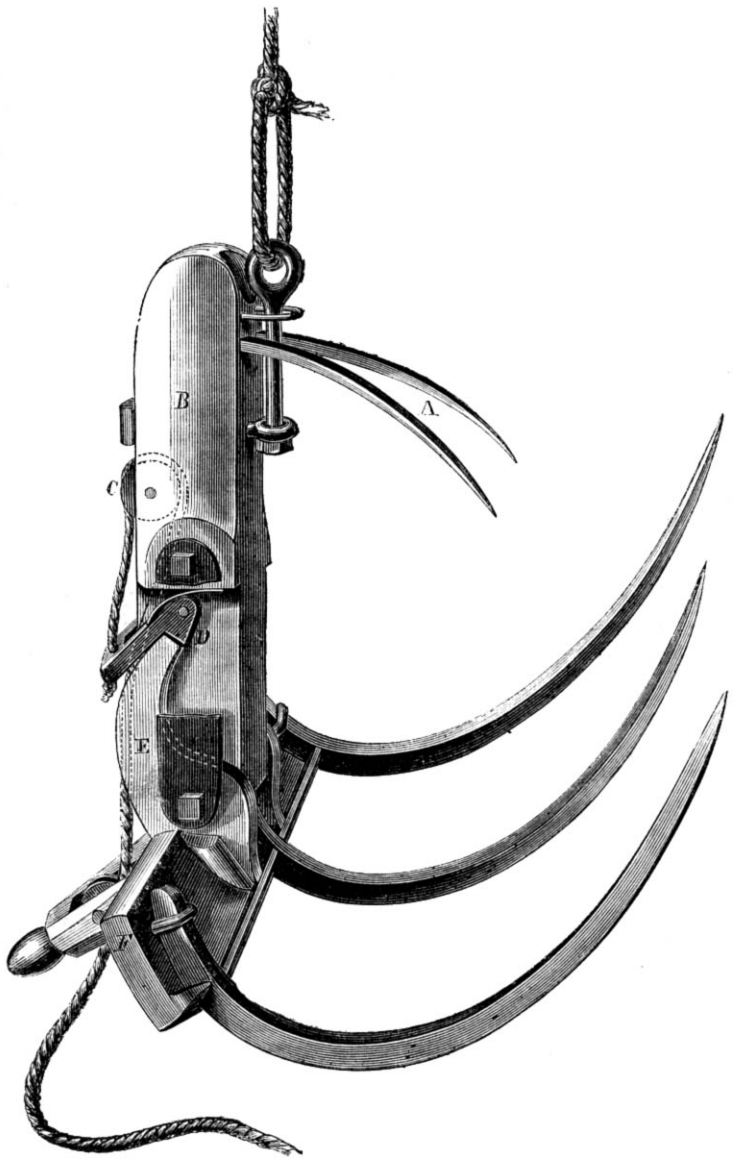
INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given ; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds

Improved Hay Fork.

Quite recently, in a trip through the country, we saw a neat farmhouse, with well-appointed buildings sleek-looking stock, and well-kept fences, but as an offset to this picture of prosperity, there was not a sign of a machine about the premises. Thrift and economy had done by hard work what we have described, but the farmer was worn down with toil and exposure. We could not help thinking that by the aid of modern machinery he might have spared himself some labor and enjoyed his possessions all the better therefor.

It is hard work to pitch hay on to a cart, and from it to the mow, and a person engaged in this occupation does a tremendous amount of labor in a day.



WELLS'S HAY FORK.

Since machinery has been invented for this purpose it should be more generally used.

Horse hayforks are re-garded with great favor by enterprising farmers, and we here illustrate a new one which has lately been invented. The chief feature of this fork is the certainty with which it retains the load after it is taken on. Persons who have used these tools know that of- ten times when a large quantity is taken at once, the loose portions topple off and get scattered about, making a great deal of extra labor to collect it again. With this fork no such trouble occurs, as it is provided with two projecting tines, A, on the main beam, B, which are stationary, and place the load firmly, so that there is no escape and no waste, at the same time these tines do not interfere with discharging the load. This latter duty is performed by pulling the line as usual. The rope runs over the pulley, C, as shown by the dotted lines, and the end is fastened on the latch, D; by raising this catch the arm, E, which bears against the shoulder of the catch, is displaced and the fork falls, discharging its load. The tines of the fork itself are well hung to the shank, F, being set so that they cannot spring sidewise and so that they flare at their outer ends, thus affording a good support to the load.

These are the principal features of this fork, and we regard it as a very good one of its class. It was patented through the Scientific American Patent Agency on Oct. 11, 1864, by J. L. Wells, of Ames, N. Y. Address him at that place for further information.

To Etch on Glass.

Etching with hydrofluoric acid on plate glass is practiced now to a very considerable extent, the French manufacturers especially producing splendid ornamental effects by the process. The drawings to be imitated or etched on the glass are first made on stone or plate and then printed on unsized paper with fan ink consisting principally of a solution of asphaltum in oil of turpentine made with the aid of heat, to which some substance is added which shows a more or less crystaline structure on cooling, as stearic acid, spermaceti, naphtaline, paraffine. This mixture is strained and rapidly cooled with constant stirring; it is the only kind of coating which thoroughly resists the action of the corrosive acid. The printed paper is laid flat with the blank side on water, to which from 10 to 25 per cent of muriatic acid has been added, and as soon as the lines show signs of softening the negative printing is transferred to the glass by a slight pressure and when the paper is then removed the picture will adhere to the glass, and this is afterwards exposed to the fluoric vapors in leaden troughs.

Druggists' Circular.

[This acid is very dangerous to handle and should be used with great care. The fumes of it must not be inhaled and it makes a sore on the flesh where it touches.—EDS.

A First-rate Paper.

With the next issue (July 1st) the New York "SCIENTIFIC AMERICAN" commences its thirteenth semi-annual volume (new series), and we avail ourselves of this opportunity of saying that if there is any mechanic, scientific man or manufacturer who is not in weekly receipt of this most excellent periodical, he does not study his own interests. It is by far the ablest of its cotemporaries in its peculiar department, and deserves the widest possible circulation. Its proprietors, Munn & Co., 37 Park Row, New York city, are the sponsors of about one-third of all the patents issued in this country, and their judgment in matters of this kind adds greatly to the value of their publication. Terms $3 per annum, in advance.—*Chicago Journal.*

"THE PIPE OF PEACE."

Sir Walter Raleigh is said to have been quietly smoking in his study long years ago, when his servant, alarmed at the spectacle, and supposing his master on fire, immediately drenched him with the contents of a jug near at hand.

This injudicious attack, like all other intemperate onslaughts on familiar habits, utterly failed of its effect, and Sir Walter continued to smoke placidly, as do all his descendants to this day.

Very great improvements have been made of late in tobacco pipes. Rosewood, laurel and brier wood have been employed as material for the bowls and stems, in the place of fragile clay.

The pipe herewith illustrated is convenient and handsome; it has also novel features, which will, no doubt, make it popular. In detail it is constructed as follows:—

The bowl is formed with a metallic reservoir, A, at the bottom, which has a joint, B, at the side. In this joint there is an elbow, C, on which the stem is fixed. The stem itself is provided with an ingenious device, shown in the portion broken out. This consists in a scroll, D, set in the tube so that the smoke must follow the passage, E, to the top before it reaches the mouth. By that time the smoke is cooled, and deprived in a measure of the heavier portions which may have been drawn through the

tube in smoking. Besides, smoke so cooled is more agreeable to the taste than at a higher temperature. The reservoir at the bottom collects all moisture which, from obvious causes, settles in the passages, and in common pipes clogs up the bowl and stem, rendering them foul in a short time. For cleaning, this pipe is especially convenient, it being only necessary to remove the scroll, E, and wash it out. The reservoir is also capable of being unscrewed from the bowl and purified. The elbow, C, enables the smoker to turn the bowl of the pipe at any angle with the stem, and thus avoid smoking in his own eyes or under the noses of other people. The elbow may be of one piece with the bowl, or separate, and of any material. The socket may be either horizontal or pointing upward.

This pipe was patented through the Scientific American Patent Agency on May 22, 1865, by F. Doellbor. For further information address him at No. 405 North Fourth street, Philadelphia.

THE department of coins and medals in the British Mueum has acquired 2,567 examples during the past year. Of these 1,350 were Creek, including 5 specimens made of glass; 512 are Roman; 474 modern or mediæval; 295 of the Roman coins are Imperial, gold, valued at £3,200. **The mint of the United States has presented a two-cent piece of 1864.**

HOW TO SET A SLIDE VALVE.

In all the works on steam engines which have been written we do not remember to have seen any account of the manner in which a slide valve is set, and we have had frequent inquiries from young—and must we say it—old engineers, who confessed they did not know much about it. It seems strange that any person should have charge of a steam engine and be unacquainted with this simple duty, yet it is a fact indisputable. Many an hour locomotives have stood on the track helpless from the slipping of an eccentric which the driver was unable to replace, and mischievous comrades have oftentimes designedly loosened set screws, (in the early days when screws alone held the wheel in place), so as to cause confusion, and subsequent dismissal, to the incompetent driver who could not reset it.

There are indeed no lack of rules in engineering works which direct us to set the eccentric, something in this way:—

"Place the crank in the position corresponding to the end of the stroke (why not say on the center?) Draw the transverse center line answering to the center line of the crank shaft on the bed plate of the engine, or on the cylinder, if the engine be direct acting, describe a circle of the diameter of the crank pin on the large eye of the crank and mark off on either side of the transverse line a distance equal to the semidiameter of the crank pin; from the point thus found stretch a line to the edge of the circle described on the large eye of the crank and bring round till the pin touches the stretched line. When the crank is thus placed at the end of the stroke the valve must be adjusted so as to have the amount of lead or opening on the steam side which is intended to give at the beginning of the stroke and the eccentric must then be turned around upon the shaft until the notch in the eccentric rod comes opposite to the pin on the valve lever and falls into gear; mark the situation of the eccentric, and put on the catches in the usual way, etc."

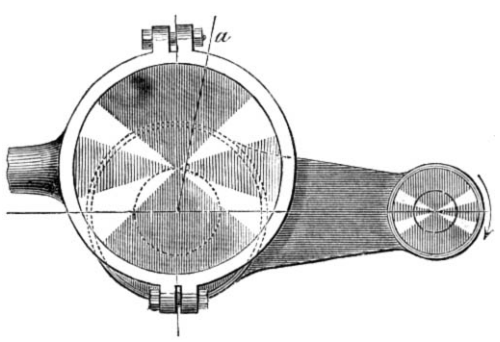
This long and incomplete instruction is from Bourne's Catechism of the Steam Engine and we are sorry to say omits one very important thing, so that it would be impossible to set a valve by this method. The omission is in getting the length of the eccentric rod at the outset. Without further criticism or discussion, we shall explain how an eccentric is set.

Presuming the proportions properly made by the draughtsman at the shop the first thing is

"TO FIND THE LENGTH OF THE ROD.

Put the straps on the eccentric and connect the valve gear as in working order. Disconnect the engine and slip the eccentric around on the shaft and observe what takes place in the steam chest. Doubtless the valve will uncover one port clear to the exhaust while the other is entirely or nearly shut. This shows the rod to be too long or too short as the case may be. If the port nearest the crank, in a horizontal engine, is wide open and the other port shut, the rod is too long and must be shortened half the difference only. We say half the difference, because it must be remembered that what is taken off one end is put on the other so that the real amount the rod is shortened will be seen in a complete revolution.

When the valve "runs square," as it is called, or opens and shuts the ports properly, set the wheel as in this diagram.



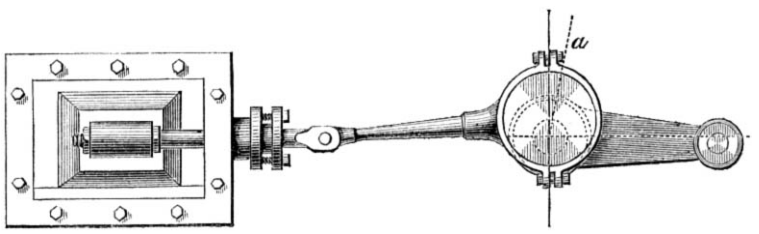
The eccentric is always in this position in every instance, whether the engine be vertical, horizontal or inclined, and the intervention of levers between it and the valve makes no difference in relation to the crank itself. The wide part of the eccentric and the crank are always at right angles to each other except such departure from a right angle as the lead and lap takes off.

The diagram represents an eccentric without lead working a valve without lap. Such a coincidence seldom obtains in practice, and the true position of the eccentric is shown by the dotted line, a; this indicates that the eccentric is turned on the shaft towards the crank thus pulling open the port behind and driving the crank in the direction of the arrows. If levers are intervened to reverse the motion of the eccentric the crank would go the other way. We are speaking of a direct connection.

It will be easily understood *why* the eccentric is always in this position when it is borne in mind that the eccentric must commence to open the valve a little before the crank gets to the center. In other words the eccentric must commence its stroke a little ahead of the crank.

AN IMPROPERLY SET VALVE.

Here is a drawing of an improperly set valve. It is not drawn to scale but is none the less a correct



example. It will be seen that the crank has passed the center and commenced the return stroke, but there is no lead on the steam side in front or at the port nearest to the crank, and before the crank passed the center there must have been much compression in the cylinder at the forward end of the stroke. The steam was shut up in the cylinder and its tension or elasticity greatly increased thereby. Steam like other gases follows a law discovered in some experiments by a French philosopher called Mariotte. According to this authority if steam at 60 pounds be shut up in a cylinder six inches long and the piston in said cylinder be pushed down to three inches the volume will be reduced one half and the pressure will have been raised to double or 120 pounds.

So when the exhaust closes too soon, say at six inches from the end of the stroke, when the crank is on the center the pressure will be in proportion to the amount of cushioning or compression. There are many engines working in this condition to-day; should they not be attended to?

Setting the valve with a link motion is precisely the same operation; the eccentric stands exactly as shown in the diagram. There is only this difference —the lead is somewhat disturbed by the action of the eccentric rod which is not in gear, whether it be the forward or back connection. This derangement causes some change in the lead when cutting off at low grades of expansion; and it is necessary to take this into account when setting the valves. The lead should be given properly on the point the engine is to work at, for since the lesser rates of expansion are only used on emergency it matters little whether they are correct or not.

Concluded next week.

MAGENTA AND ITS DERIVATIVE COLORS.

At the weekly meeting of the Royal Institution of Great Britain, held on Friday, May 12, 1865, a paper was read by Frederick Field, F.R.S., from which we take the following extract. After giving the chemical constitution of aniline, he says :—

From the earliest discovery of aniline it was noticed that certain oxidising agents when mixed with a solution of its salts produced a fine violet tint. Even in minute quantities, a few drops of hypochlorite of lime render it purple. There is another test for aniline, which I will show you, and which, as far as I am aware, has not been observed previously. If the red gases obtained by the decomposition of nitric acid by starch or sugar be passed into an aqueous solution of aniline, the liquid speedily assumes a yellow color, owing to the formation of a new base—azophenylamine, which is gradually precipitated as a bright yellow powder. It was not, however, until the year 1856 that aniline was applied to any great practical purpose, although from the beauty of its compounds, and from its comparative accessibility, it had from the time of its discovery become a great favorite with chemists. Mr. Perkin was the first who produced color on an extensive scale from this base. He added a solution of bichromate of potash to a salt of aniline, and from the precipitate thereby produced he isolated a magnificent purple dye, he termed "mauve," which at once become popular, and indeed at the time almost universal. It may truly be said that this discovery has identified Mr. Perkin with the aniline colors, and that he will be always associated with one of the most striking and brilliant passages in the history of chemistry as applied to the industrial arts. It cannot be supposed that such a discovery would be allowed to rest. A mine had been opened which chemists began to explore, and in such numbers, and with such avidity and zeal, as almost to lead us to anticipate that its riches will soon be exhausted. The action of numerous bodies upon aniline and its homologues was found to be productive of color. Nitrate of silver, nitrate of mercury, chloride of mercury, chloride of tin, arsenic acid, iodine, and many others, when heated with the base, gave a rich crimson color, in more or less abundance; and, although it would be impossible for me to enter into a disquisition on the comparative merits of these various methods for the production of color, I trust to be able to produce magenta, although in somewhat crude form, at this lecture table, and also to dye this tassel of silk from a solution of its salt. The reagent I will employ is iodine. A few crystals of this element are placed in a tube with about twice their weight of aniline. Heat is at once evolved, and with the assistance of a higher temperature from the spirit lamp, you will observe that in a few moments intense color is developed. If a few drops are now poured into spirit, and this solution added to water, a fine rose-colored tint will appear.

It may seem strange to those who have read Dr. Hofmann's beautiful researches upon the aniline substitutive products, his chloraniline, bromaniline, iodaniline, and a multitude of others, that he had not observed this curious reaction; and this leads me to tell you, *en passant*, for time will not allow me to dwell upon this interesting topic to night, that aniline, when perfectly pure, does not yield any amount of color with most of the reagents mentioned above—a most important fact discovered by Dr. Hofmann and Mr. Nicholson, and which has given rise to one of the most difficult questions which yet remains to be answered. I will simply say that it appears that there must be a homologue of aniline present with that base to produce the color you see before you, although that homologue, *per se*, will give no color whatever. Thus, for example, toluidine, $C_7 H_9 N$, when treated with oxydizing agents, does not produce color; let it be mixed with aniline, and the dye is immediately developed. The tintorial power of the salts of magenta is something marvellous. No dye that I have examined, whether from the animal, mineral, or vegetable world, can bear comparison for one moment with this crimson color obtained from aniline. One grain in a million times its weight of water gives a pure red, in ten millions a rose pink, in twenty millions a decided blush, and even in fifty million, with a white screen behind the vessel in which it is dissolved, an evident glow.

Personal.

Dr. Thomas Antisell, whose card appears in our advertising columns, was for several years chief examiner of the chemical department of the Patent Office. Since the beginning of the war he has been a volunteer surgeon in the Union army, where he has rendered valuable service to our brave suffering soldiers. Dr. Antisell is the author of valuable scientific works, and is well qualified to give advice and assistance in the line of his profession. We wish him much success.

EGYPT is waking up. A nobleman of Alexandria has 44 steam engines, which work 22 steam plows and cultivators on his estate.

Notes and Queries

J. H. D., of Mass.—According to the census returns of 1860 the property of the people of this country was worth $16,000,000,000; the national debt, when all the bills come in, will amount to about $3,000,000,000. Consequently, to pay off the debt everybody must contribute one-fifth part of his property; this nobody is willing to do. The debt can and will be rapidly paid, but it must be done by vigorous taxation.

C. W. H., of Conn.—It has been demonstrated that a balloon cannot be navigated by muscular power. The muscular force of a man could not at the utmost cause a balloon large enough to support him in the air to deviate from the direction of the wind more than four miles in an hour.

Clarendon, of Tenn.—We have perhaps been too accommodating in republishing articles two or three times at the request of correspondents; however, we give you again Capt. Hall's cure for drunkenness: sulphate of iron, 5 grains; magnesia, 10 grains; peppermint water, 11 drachms; spirit of nutmeg, 1 drachm—twice a day.

E. S., of Ill.—Iron is galvanized, as it is improperly called, by being immersed in molten zinc. For a minute description of the process see page 243, vol. XI.

I. M., of N. Y.—A patentee is not obliged to show his patent, but you can procure a copy of it from the Patent Office.

J. M. C., of Fla.—We do not think you can purchase in this market a machine capable of sawing down standing trees. Such machines have been invented but have not proved successful so far as we can learn.

I. L. F., of R. I.—We neither buy nor sell patents, therefore must decline to purchase your horse shoe.

G. W., of Mich.—You say that a certain party has obtained a patent for an invention which you and others have publicly used for upwards of ten years, and wish to know if the patentee can now stop you from continuing to use it. We answer no; the invention is public property.

O. H. B., of Ind.—Augers to bore hard wood are made from one to two feet in length, and can be had at most tool stores in large cities. Car-makers use them.

C. H. B., of Mass.—For your small boat, 18 feet long, 4½ feet beam and 12 inch draft, you can use a screw of 12 inches diameter and 20 inches pitch. You may use a larger screw by putting the shaft as low in the boat as the crank will allow, and attaching a shoe or guard to the keel behind the screw, so that its blades will not strike in shoal water, as they would if the diameter of the screw was greater than the draft. As to the form, make it a true screw; as to the blades, use three; as to the velocity, run it as fast as you can.

P. K., of Tenn.—We are pleased to hear from you. Iron ore is so abundant that it is of no value in the bed except in favorable positions.

W. A. L., of Ohio.—Giffard's injector will work with steam at a less pressure than 40 pounds.

D. K., of N. Y.—Gun cotton is sometimes decomposed by long exposure to air and moisture, but we never heard of its burning by spontaneous combustion.

G. C. B., of Iowa.—A horse-shoe magnet weighing 1 pound has been so charged as to sustain a weight of 26½ pounds. The attraction of magnetism passes freely and without diminution through all known substances.

R. E., of Mo.—The *London Builder* is a paper of very high character. There is no paper in this city devoted exclusively to architecture and building.

H. H., of N. J.—Dr. Trimble, the naturalist, of your city, will tell you how to catch humming birds.]

T. T., of D. C.—J. W. Stevenson's turbine gave the largest yield of power at the great competitive trial at the Philadelphia Water Works. His address is No. 100 Broadway, N. Y.

SPECIAL NOTICES.

Robert Bates, of Philadelphia, Pa., has petitioned for the extension of a patent granted to him on the 30th of September, 1851, for an improvement in instruments for the cure of stammering.

Parties wishing to oppose the above extension must appear and show cause on the 11th of September next, at 12 o'clock, M., when the petition will be heard.

Stephen P. Ruggles, Boston, Mass., has petitioned for the extension of a patent granted to him on the 23d of September, 1851, for an improvement in hand stamps.

Parties wishing to oppose the above extension must appear and show cause on the 4th day of September next, at 12 o'clock, M., when the petition will be heard.

Joseph H. Moore, Chicago, Ill., and Wm. P. Parrott, Boston, Mass., have petitioned for the extension of a patent granted to them on the 2d day of December, 1851, for an improvement in steam carriages for railways.

Parties wishing to oppose the above extension must appear and show cause on the 20th day of November next, at 12 o'clock, M., when the petition will be heard.

Correspondence

Copper Cartridges in Cold Weather.

Messrs. Editors:—My communication in regard to the effect of severe cold upon copper cartridges has naturally excited a good deal of attention, and a considerable amount of testimony, verbal and written, has reached me since its publication. I have regretted that my correspondents did not send their communications directly to you, and have waited in the hope that your columns would contain further evidence than the letters of Messrs. Plaisted and Perry, which thus far are the only published replies I have seen, and both of which are simply negative and prove nothing. Mr. Perry's testimony has rather a formidable look in consideration of the great number of cartridges he has fired, but its weight is destroyed by the fact that the ammunition was kept and fired under cover, being used in proving Spencer rifles. Mr. Plaisted has fired from one to two thousand cartridges, has had but two miss-fires, and is convinced neither of them was owing to cold. Very few men have been equally fortunate, I cannot tell how many thousands I have fired and seen fired, but I am sure the proportion of misses has been very much larger than his, though it never occurred to me at the time to attribute them to cold weather. I always turn a cartridge when it misses, and try again, sometimes with a successful result, oftener not.

By the kindness of Major Laidley, I have been furnished with a carefully-prepared report of an experiment which has been tried at the Springfield Armory, for the purpose of testing the question, and which seems clearly to prove that the cartridges are not affected by cold. A quantity of cartridges were placed in a refrigerator from which they were taken and fired at different times, none being less than an hour, and the greater portion forty-four hours in the freezer, exposed to degrees of cold varying from 30° above to 2° below zero. Five hundred and twelve cartridges were thus fired without a single miss, and Mr. Porter (the foreman by whom the report was prepared), says in conclusion, "I could see no difference between those which had been in the freezer the greatest length of time and those that had not been in at all."

This testimony would seem to be conclusive against the opinion I advanced in my former communication, which, it will be remembered, was based upon what I had learned from others. On the other hand I have the assertions of perfectly reliable men—two of whom are scientific men—as well as sportsmen, that they find these cartridges so unreliable in severe cold weather in Canada and Michigan, though taken from the some lots, which prove perfectly reliable in summer, that, as one of my correspondents says, "I have had to lay them aside as useless and should not think of taking them on any future winter expedition." He adds, moreover, "But almost invariably, on warming those which had missed, in the hand or pocket they have exploded." I have verbal and written testimony to the above effect from different sources entirely unknown to each other, and whose interests would certainly prompt them to make the best of the only ammunition they could use in the guns with which they had provided themselves. I cannot withhold my belief from their testimony, and I can only express the hope that we may have further light upon the subject which will enable us to decide a question which is certainly a very important one.

H. W. S. Cleveland.

Danvers, Mass., June 7, 1865.

The Perpetual-motion Clock.

Messrs. Editors:—Your New Zealand and also Harrisburg, Pa., correspondents are both mistaken in assuming the so-called perpetual-motion clock described by them to be "new to all the world." My father, Col., S. Boon, of Hamilton, Madison Co., N. Y., in the year, 1842, invented and constructed a clock operating upon similar principles, viz., the expansion of fluids made upon the same principle as a thermometer. A large sphere was the receiver into which was placed a metallic cylinder; a piston was placed in the cylinder; upon the cross-head of the piston rod was attached a double rack with suitable guides to keep the piston rod straight with the cylinder. Upon the cross-head were also placed weights of 25 lbs. each. He filled the ball or sphere with oil, which kept every thing lubricated, and obtained the power necessary to wind the clock by the contraction and expansion of the fluid. The weights carried down the piston rod and the expansion carried it up—winding the clock both by expansion and gravitation, by means of racks and ratchet wheels. The clock wound from the center of the spring, on the same principle that American watches are now made. It is unnecessary to explain further.

I would simply say that it was examined by many prominent gentlemen, and to satisfy the incredulous that it was wholly destitute of deception, we obtained certificates from Dr. Nott, Prof. Silliman, Prof. Finney and many others, who witnessed its operations and pronounced it unlimited in its power, excepting in strength of machinery, and would continue to run without aid from man as long as the material of which it was composed would last. It was on exhibition at the American Institute, in New York city, in 1843. I have many portions of it now in my possession, which I can exhibit to any inquirer.

Alonzo Z. Boon.

Galesburg, Ill., July 1, 1865.

The Government Flying Machine.

Messrs. Editors:—In looking over your valuable journal I saw a statement concerning a new flying machine, in process of construction at Hoboken, to be propelled vertically and horizontally through the air by screw fans; propelled by a steam engine placed in a cigar-shaped car with one fan above and one below the car and one at each end. Now the thing looks very squally to me. How can they give a rotary motion to the lifting fan without causing the car to rotate in the opposite direction without having a fan to act against it? If the rear fan was left off, the front fan falling through the air would prevent it more or less, but not sufficiently, and the lower fan would have a tendency to equalize the thing. It looks to me as though the motion would be more like a Boomarong than anything I know of. If the propelling power was communicated from the earth, as Prof. Mitchel's experiments were, it would look more plausible; for then the engine would have a solid foundation, or a momentum given to it before it started independent of itself like the child's toy.

S. D. Engle.

Hazleton, July 1, 1865.

Water Wheels by Night and Day.

Messrs. Editors:—In your issue of the 1st inst., I see some remarks on the mysterious effects of water on wheels, in the day time and in the night. I also see you infer from the communication from the Cumberland Valley Mills, that the mystery is only imaginary. Years ago I was placed in positions so that the fact exhibited itself to me. On investigation I found that a sluice or opening for the water to pass through in the day time would be 10 inches wide, while in the evening the opening would be 9 inches to give the same motion by the usual kind of governor and running the same machinery. On following up the investigation it was discovered that the contraction commenced, in clear weather, two or three hours before the sun set and continued until midnight, then remained until day light without change, then commenced to enlarge and continued until noon; then no change until two or three hours before sundown. In clear weather there is not so much change experienced. The philosophy my mind has settled down upon is that the sun's rays rarify the air in the day time thereby changing the center of attraction of the earth so that the same column of water would require a larger capacity to pass through while the sun is on the horizon than when not on the horizon. The results are as above related, the philosophy is my individual opinion only, as nothing has come under my observation giving me any light on the subject. I should be pleased to see an explanation of the laws by which the phenemenon is produced.

Andrew R. Arnold.

Newark, N. J., July 5, 1865.

[We publish this communication out of respect for the writer, who is a remarkably skillful and successful manufacturer; but the account of the observations is not sufficiently detailed and definite to give us a particle of confidence in the conclusions. We

can see that with several kinds of wheels and gates in practical use the variations might all have resulted from changes of flow of water in the stream. Let everything be carefully weighed, measured and counted as it was by our Pepperell correspondent.—EDS.

Water Wheels and Belts.

MESSRS. EDITORS:—I see a correspondent is troubled with a mystery about water wheels going more quickly by night than by day. A wheel will go quicker by night than by day, if the night is a good deal colder than the day. The fact is that water contracts in cooling down to 39° Fah.; consequently becomes heavier, bulk for bulk; or in other words, the specific gravity is increased, the water gage and every thing else remaining the same, the wheel will go quicker with the cold water.

On the subject of belts, I think Mr. Cooper's rule—66⅔ square feet per minute per horse power—a very good one. I lately put up one 12 inches wide, with a velocity of 800 feet per minute, to drive a pair of wheat burrs, 54 inches diameter, 140 turns per minute. I calculate the power at 12-horse. The belt works beautifully. Divide 800 by 12, and the result is 66⅔ per horse-power. This belt had a tightner pressure, as near as I can calculate, of 400 pounds, which would be a pressure of 33⅓ per horse-power. The belt runs horizontally. We used to put on a 10-inch belt on an 80-foot fly-wheel on engines which we sold for 12-horse power. This belt would have a velocity of 1,000 lineal feet per minute, which you see comes very near Mr. Cooper's rule—66⅔ per horse-power. But this subject will never be definitely fixed till some one makes experiments with winding up weights, etc., for which perhaps some of your many correspondents may have time and machinery. J. W. H.

Wilmington, Del., July 5, 1865.

[The suggestion that the condensation of water by the reduction of temperature might cause a wheel to run faster in the night than in the day is perfectly sound. The effect, however, would be scarcely perceptible except by means of very delicate instruments. Large bodies of water are cooled or warmed very slowly, and the change of temperature from day to night would probably seldom be more than two or three degrees. If the change was ten degrees, 10,002 cubic feet of water at 50° would become 10,000 cubic feet at 40°, making a difference of one-fiftieth part of one per cent.—EDS.

Further Queries About Belts.

MESSRS. EDITORS:—I notice in your columns some discussions in regard to the power of belt, rules for determining it, etc.

Now there is a question connected with belting that I would like to have solved. It is this:—Given certain sized pullies and belt; must we double the width of those pulleys and belt at same speed, to get double the power? It seems to me in practice that a 12-inch belt, under the same circumstances will transmit more than double the power of a six-inch belt, and yet I can give no particular reason for it; perhaps some of your mechanical correspondents can give light on the subject.

Lambertville, N. J., July 1, 1865.

Th Most Rational Explanation Yet of the Ball and Jet.

MESSRS. EDITORS:—In the correspondence of your last number I see a query and remarks upon the subject of a ball balanced upon a fluid jet; and it offers a striking comment on your recent remarks upon "observation," that this correspondent states an observed fact connected with the subject which at once refers it to a large list of common-place phenomena, alongside, indeed, with all that interesting class of appearances which grow from the disposition of rotating bodies to preserve the plane of their rotation. The fact once ceing known that the ball always exhibits a violent rotation in some plane, the retention of its position will no longer surprise those who are familiar with the feat of mountebanks in balancing large numbers of earthen plates upon the ends of sticks at such degrees of inclination that they will fall in an instant if they cease their revolutions. But the common top or teetotum and rotascope or gyrascope are still more familiar instances of the ease of balancing a rotating body upon a point of support out of line with a perpindicular let fall from its center of gravity. The manner in which it is known a power acting upon a revolving body apparently neutralizes its own effect will show how the impinging jet would have but little power of displacement, unless it act in such a direction as to throw the ball aside without changing the plane of its rotation. Of course, I do not offer this as exhaustive, but merely as containing the germ of a probably true solution. ISAAC E. CRAIG.

Cleveland, July 10, 1865.

Attaching Labels to Tin.

MESSRS. EDITORS:—Mr. Lefflen desires me to thank you for your perseverance in his patent case, and to assure you that in any other case he may have he shall apply to you for assistance.

While I am writing, I will you give a receipt for publication which at one time was a great want with me. It is for putting labels on tin with common paste. Whitewash of common lime will do it, and not tarnish the tin. Wash the tin, and when dry wipe it clean; the label will then stick as well as on wood. The manufacturer can wash the tin in sheets, as I did, but must be careful to put the washed side out in making up. As you publish information for the people, you can, if you wish, put this in shape. At one time I would have been willing to give $50 for it.

GEO. T. JOHNSON.

Marshall, Henry Co., Iowa, June 26, 1865.

[It is also said that labels will adhere with common paste if the can be washed first with strong vinegar.—EDS.

Improved Method of Setting Splinters for Diamond Drills.

MESSRS. EDITORS:—Having had occasion to use diamond drills for perforating porcelain, in experimenting toward a new method of restoring defective crowns of natural teeth, I ordered this instrument from a New York lapidary, who informed me that there was always a degree of uncertainty about the point remaining firm. I experienced this difficulty before I had drilled a single hole with a ¾ line drill. I reset this splinter in the following manner: Having prepared the pieces in the usual way, I sunk a triangular recess in the smaller piece, using for this purpose an obtuse drill and an engraver's flat burin. The usual offset was filed in the other half, but with the shoulder cut under with a three-square file, corresponding with the bevel of the splinter. The space was adjusted so that the splinter held the pieces slightly apart. The parts, with the point in place, were next attached with soft solder, and two small holes were drilled through the rod, one about a line from the splinter and the other near the end of the smaller piece. These holes being tapered with a broach, and fitted with soft steel pins, the soft solder was scraped off and the two pieces brought to a spring temper, and then riveted together.

I have used this drill considerably, and it is perfectly firm. By tempering the setting and riveting together, two important advantages are gained—hardness, with additional tenacity, and tension. These objects are defeated by using silver solder in making drills. GAM'L JACKSON.

Winona, Minn.

Destruction of Bolting Cloths by Insects.

MESSRS. EDITORS:—Would you have the kindness to ask some inventive genius to make a machine or some contrivance to prevent the bugs from eating holes through the bolting cloth in flouring mills. The machine must be constructed so as to keep them from the inside and outside. No miller would hesitate to pay a handsome sum for an effectual preventative. As it is now, it is a great annoyance and expense; constantly repairing and patching is the order of the day through the summer season.

JOHN H. TEAHL.

Cumberland Valley Mills, June 29, 1865.

Work on the Pacific Railroad.

The *Stars and Stripes*, a paper published at Auburn, California, gives the following account of the rapid progress of the Pacific Railroad through the Sierra Nevada mountains:—

The Pacific Railroad is now being constructed through this county with a rapidity almost unparalleled in the history of railroad building. The hills are being cut down, vallies filled up, bridges erected, and all kinds of railroad work going on as fast as 2500 able-bodied men, with a full complement of teams can do it. It is astonishing to see how much such a force, when directed by able and skillful superintendents, and the appliances of modern engineering can accomplish. We had hardly began to realize that the work had commenced cast of Newcastle, before the steam horse was snorting on the hill tops at Clipper Cap, in the heart of the mountains, 43 miles from Sacramento and 1800 feet above the sea. Soon his shrill whistle will be heard at Illinoistown. We learn that the directors have fixed September 1st for that event, and if it can be accomplished in that time it is sure to be done. The work is heavy, but the force is strong and the zeal is irrepressible.

Our citizens now fully realize that the Pacific Railroad is becoming a fixed fact, and not many years will elapse before the completion of this gigantic work will be celebrated, and what a celebration it will be. A continuance of the energy now displayed will soon carry the road over the mountains, and then for a rapid race for Salt Lake. The heavy work on the line west of Salt Lake, is right here in Placer county, and is now being vigorously attacked by the company. We never imagined the work would be so heavy, or that it could be completed so rapidly.

One of the most interesting excursions that can be made by sight seers, is a trip on the railroad line from Clipper Gap to Illinoistown. The cuttings are all in rock of greater or less hardness, and the boom of the powder blast is continually heard—frowning embankments rise as if by magic—high trestle bridges spring up in a week. Let those who are skeptical about the construction of the work visit that portion of the road and their eyes will be opened.

Persons who have never seen the line before the work commenced, or while it is in progress, can form no correct idea of the immense amount of labor required to construct the railroad over the mountains. But the company do their work well, and when finished it will be one of the greatest feats of railroad engineering in the world. Ten, yes twenty miles of valley road can be made as easily as one of this mountain line. Everything about the road is of the most substantial character. Travelers state that it is not excelled by any railroad in the Atlantic States. For one we are proud of this movement of California enterprise.

Mode of Rendering Wood Plastic.

A new and very simple method of effecting this has been lately discovered. It consists in forcing dilute hydrochloric acid through the cells of the wood, at a pressure of about two atmospheres. This impregnation must be continued for a length of time dependent on the nature of the wood. The bark is not previously removed, and by a very simple arrangement the fluid is introduced at one end of the log and passes out at the other. If while the wood is still wet it is exposed to pressure, the cells having been first washed out with water, its volume may be reduced to a tenth of what it was originally, the fibres being brought into the closest contact without being fractured or torn; and when dry they have no tendency to separate again. If it is pressed in dies, their details are brought out with the greates sharpness and the most perfect accuracy. Impregnation in this way can be used for a variety of purposes. After the action of the hydrochloric acid, washing out with water, and drying, the wood may be cut with remarkable facility, and it answers admirably for the purposes of the carver. The drying is effected by forcing air, at a temperature of about 100° Fahr., through the cells. The moisture is thus carried off with great rapidity; and, as the contraction is uniform through the whole mass, no cracks are produced. Dyes also may be introduced in the same manner into the entire substance of the wood, or matters calculated to preserve it from decay. Soluble glass, or recently precipitated silex, renders it both very durable and thoroughly incombustible.—*Intellectual Observer*.

DYNAMOMETERS.—Parties making or selling dynamometers, or instruments to measure the force in pounds exerted by any machine or belt, will do well to advertise them, as we have had frequent inquiry for them.

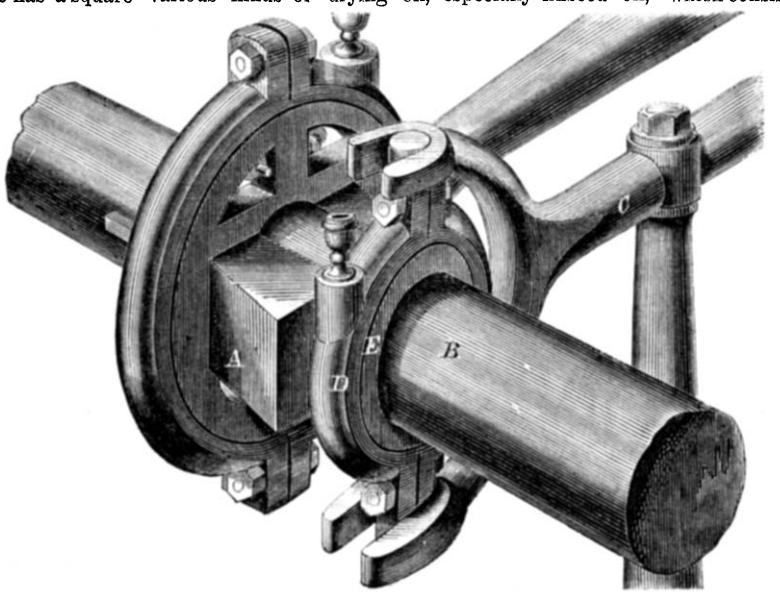
Improved Eccentric.

This is a most ingenious method for reversing and cutting off steam with one eccentric. By it the steam can be cut off at any point of the stroke with a common slide valve and without altering or affecting the lead on the steam or exhaust in any way.

In detail this invention consists of two wedges, A, fitted to the shaft, B. The eccentric has a square slot in it which these wedges completely fill, and they act the same as wedges would work driven by a hand hammer, for by slacking one wedge off, and driving the other in, the throw of the eccentric is changed at will. These wedges are worked in this way by the lever, C, which is attached to the straps, D, embracing a coupling, E, formed on the end of the wedges, so that as these and the coupling revolve together the lever is enabled to shift them without being disturbed itself.

The wedges have a feather or key on the shaft which holds them from slipping. This method of operating an eccentric is applicable to all classes of engines. Any lead required can be got by setting the wheel out of the center parallel with the slot. It is a neat contrivance for the purpose.

It was patented by D. F. Walker, through the Scientific American Patent Agency on March 7, 1865. For further information address him at Clearwater, Minn.

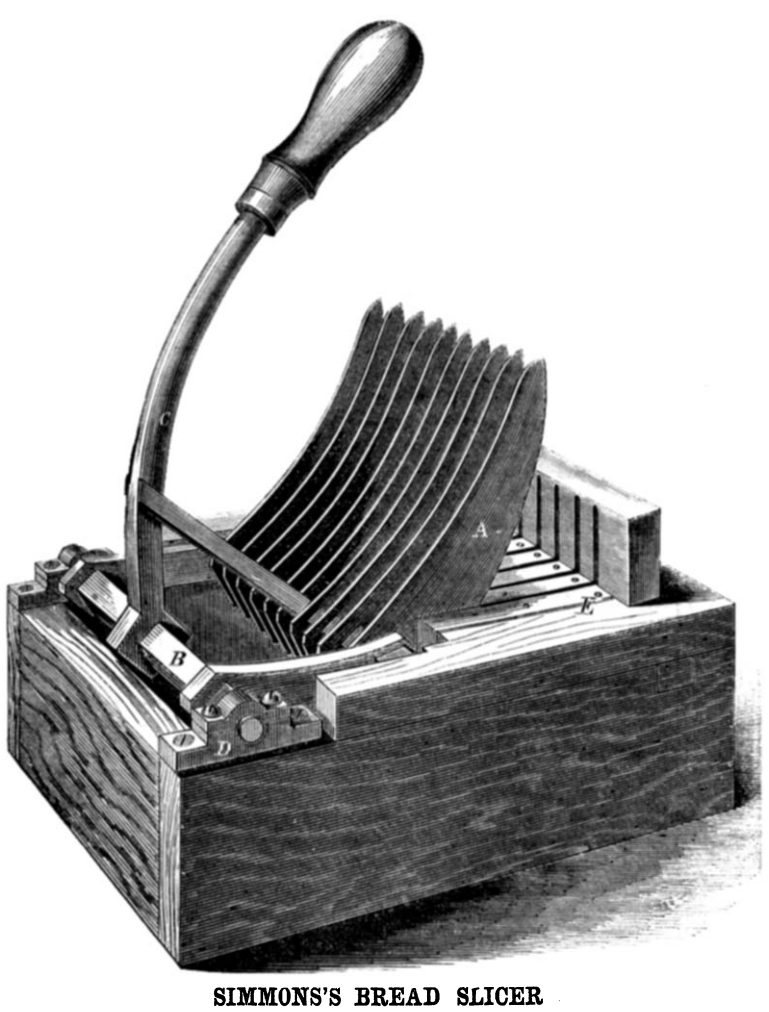


WALKER'S ECCENTRIC.

Improved Bread Slicer.

Stimulated by inquiries for a good bread slicer, inventors have produced several varieties of them, constructed on different principles but tending to the same end—rapid and certain delivery of slices of bread smoothly cut and of equal thickness. It is obvious that a simple machine for this purpose would be very useful in restaurants, hospitals, boarding houses, etc., where large numbers of loaves are cut up in a few minutes.

The engraving published herewith exhibits a very simple device for the purpose above stated. It is nothing more than a set of knives, A, of any required number, fastented to a shaft, B, said shaft being operated by a lever, C. The shaft turns in its bearings, D, and the knives work through slots in the board; it is obvious that by giving motion to the handle the knives will pass through a loaf placed under them. The cut made is a drawing cut which tends to sever the slice smoothly and without crumbling. A patent is ordered to issue on the machine through the Scientific American Patent Agency. For further information address the inventor, S. D. Simmons, San Francisco, Cal.



SIMMONS'S BREAD SLICER

International Iron-clad Show.

The iron-clads belonging to France and England are about to make an amicable tour together for the purpose of exhibiting their sailing qualities and general adaptation to the ends required of them. They are to cruise in the waters adjacent to the British Islands and to France, and will no doubt deport themselves in all ways possible in storms and calms, in smooth seas and rough—to the end that satisfactory reports may be made to the powers that be of their performances.

To the disinterested and impartial observer on this side the ocean it would not appear that much reliable information could be obtained in this way, and that so far as judging of the offensive or defensive qualities of iron-clad ships, the cruise will be quite useless. We shall hear of extraordinary speed, no doubt, and weatherly qualities, but what avail are these when heavy shot can be sent through one side and out at the other?

Paraffine for Waterproofing.

The materials which in modern times were first employed for water-proofing were beeswax and the various kinds of drying oil, especially linseed oil, which were rendered more siccative by boiling or some other of the processes usually employed for that purpose.

About forty years ago caoutchouc was first successfully used, for rendering fabrics and other materials waterproof, by the late Mr. Chas. Macintosh; and after an interval of about twenty years, gutta percha was first imported into this country, and immediately applied for similar purposes.

In 1832 paraffine was discovered by Reichenbach in the course of his admirable researches on wood and coal tars. He, however, only succeeded in obtaining it in very small quantity, so that for a long time it was only known as a chemical curiosity. It is to Mr. James Young that we are indebted for the production of this material on an industrial scale, by his process which he patented nearly fifteen years ago. About three years since a patent was taken out by Dr. Stenhouse for employing paraffine as a means of rendering leather waterproof, as well as the various textile and felted fabrics; and in August last an additional patent was granted Dr. Stenhouse for an extension of and improvement on the previous one, which consisted chiefly in combining the paraffine with various proportions of drying oil, it having been found that paraffine alone, especially when applied to fabrics, became to a considerable extent detached from the fibre of the cloth after a short time, owing to its great tendency to crystalize. The presence, however, of even a small quantity of drying oil causes the paraffine to adhere much more firmly to the texture of the cloth, from the oil gradually becoming converted into a tenacious resin by absorption of oxygen.

In the application of paraffine for waterproofing purposes, it is first melted together with the requisite quantity of drying oil and cast into blocks. This composition can then be applied to fabrics by rubbing them over with a block of it, either cold or gently warmed, or the mixture may be melted and laid on with a brush, the complete impregnation being effected by subsequently passing it between hot rollers. When this paraffine mixture has been applied to cloth, such as that employed for blinds or tents, it renders it very repellent to water, although still pervious to air.

Cloth paraffined in this manner forms an excellent basis for such articles as capes, tarpaulins, etc., which require to be rendered quite impervious by subsequently coating them with drying oil, the paraffine in a great measure preventing the well known injurious influence of drying oil on the fibre of the cloth. The paraffine mixture can also be very advantageously applied to the various kinds of leather. One of the most convenient ways of effecting this is to coat the skins or manufactured articles, such as boots, shoes, pump-buckets, harness, etc., with the metal composition, and then to gently heat the articles until it is entirely absorbed. When leather is impregnated with the mixture, it is not only rendered perfectly waterproof, but also stronger and more durable. The beneficial effects of this process are peculiarly observable in the case of boots and shoes, which it renders very firm without destroying their elasticity. It therefore not only makes them exceedingly durable, but possesses an advantage over ordinary dubbing in not interfering with the polish of these articles, which, on the whole, it rather improves.

The superiority of paraffine over most other materials for some kinds of waterproofing consists in its comparative cheapness, in being easily applied, and in not materially altering the color of fabrics, which, in the case of light shades and white cloth, is of very considerable importance.

It will be evident from the statements which have just been made, that the employment of paraffine for waterproofing purposes is likely to become very exensive.—*Practical Mechanics' Journal.*

The Paris Society for the Encouragement of National Industry has offered a prize of $300 for an ink which will not corrode steel pens.

A Large Total.—The expenditures of the Government during the past year amount to the enormous sum of $1,200,000,000, or over $3,500,000 per day.

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VOL. XIII. NO. 4...[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, JULY 22, 1865.

IS A NATIONAL DEBT CAPITAL.

The Government of Great Britain has a debt of about four thousand millions of dollars, which was contracted for the prosecution of war. Individuals in the nation delivered to the Government beef, wheat, iron, horses, sulphur, leather, and other articles needed in military operations, and received the Government bonds in exchange. The articles were destroyed or consumed in war; the value that was in them was annihilated. In the place of $4,000,000,000 of property in material wealth, the capitalists of the nation found themselves in possession of Government bonds to that amount. These bonds are simply a pledge on the part of the Government to exact the interest on the amount from the nation by taxation.

Mr. Jay Cooke has recently issued a pamphlet in which he takes the ground that a national debt is an addition to the capital of the nation, and the argument is based wholly on the fact that the bonds are saleable for cash. If a nation is able to pay the interest on its bonds, and if the Government has the ability and the will to make it pay, of course its bonds, in moderate sums, will sell at some price, but their value depends on the continued ability of the nation to produce wealth. The principal difference between an individual debt and a government debt is, that one is an obligation to return property already in existence, and the other is a pledge to deliver property hereafter to be created.

When an individual contracts a debt, property, which has been accumulated by working and saving, is passed from the hands of one man to those of another, and remains in existence; the total wealth of the community is not changed. On the other hand, when a Government contracts a debt for war purposes, property which has been laboriously accumulated is passed over to the army, and consumed or destroyed; in this case the capital of the nation is diminished to the extent of the value annihilated. The idea that the capital of the nation is increased by the transaction is absurd.

We quote from Mr. Cooke's pamphlet:—

The Englishman who has £20,000 in three per cent consols at his banker's, and only ten guineas in his pocket, and who gives assent to a proposal made to him to go mine for coal on Vancouver's Island, has got £20,000 in cash to go into the operation. He knows that positively. The world knows it. British consols are cash capital. This cannot be controverted. And the $4,000,000,000 of British debt is national cash capital to the industry and commerce of Great Britain. For half a century this seemingly and nominally huge and burdensome debt has served to vitalize the manufacturing and trading genius of the English people, and as money has enabled the British to do for that long time the marine carrying for the world, and to make for the world cloth, iron, steel, tin and hardware. This enormous mass of capital infused into the business of England at the close of her twenty-two years' war with the French Republic and Empire—almost always of par with gold—accepted as gold in all transactions—was the source of that prodigious development of mechanical industry and accumulation of wealth which so suddenly bore upward the English after the battle at Waterloo to the command of the trade and finances of the globe.

It is astonishing that a man with sufficient brains to do a large brokerage business should sign his name to such nonsense as this. England has accumulated wealth by the efforts of individuals to improve their condition. Why she has outstripped other nations in the race may be open to discussion; for our own part we suppose it to be attributable mainly to her comparatively free institutions—to the fact that her industry has been less trammeled than theirs by meddlesome legislation. However this may be, there can be no doubt that it has been done in spite of the burden of her national debt, and not in consequence of it.

It makes no material difference to the severity of this burden, whether the debt is held by native citizens or by foreigners. If a farmer who owns 40 acres of land, but has no personal property, can hire $150 to buy a horse and plow, he can, by the use of that capital, increase several fold the amount of his crop. The man who loans the money, though he live in idleness on his interest, is no burden to the community, for the employment of his capital increases the product of the national wealth to an extent greater than the amount of his interest. But if the Government hires his capital and destroys it in war, then the support of the capitalist in idleness is a burden upon the rest of the community, and the payment of taxes for his interest diminishes to just that amount the sums which they can use for their own enjoyment.

If this war had cost the whole $16,000,000,000 of the national wealth, it would have been a cheap price to pay for the preservation of the national integrity and our free institutions. Let the men who contributed their savings to the country in the hour of its need, be paid their interest punctually every six months, and their principal in full to the last dollar, but let us make no effort to argue ourselves into the transparent delusion, that the capital of the nation can be increased by the process of consuming or destroying it in military operations.

MISMANAGED CONCERNS.

Very many manufacturing concerns linger along without paying dividends, and finally dissolve and sell out at loss without the least idea what caused them to founder and go down. As with great ships that sink, so with great companies that fail—small leaks, insignificant in themselves, become formidable when neglected or suffered to run on in the hope that they will correct themselves.

An example of this is to be found in a recent failure, which it is not necessary to mention more pointedly. In this case the managers wisely determined to get all things in readiness before beginning, and therefore set about building their own machines, under the impression that they could do so much more economically than they could buy them. This was an error. They had no system, no fixed plan of procedure, no method, or experience in making their tools, for their line was an entirely different one, and as a consequence they went feeling their way along where it was all plain sailing to those who had been that route, or built such machines before.

On this very rock they split. The whole concern was full of separate machines, of which no one knew the cost within hundreds of dollars. The construction account, it is true, exhibited certain figures which purported to be the price of certain tools, but they were so far wrong that large sums remained unaccounted for, and no one could say where they went, and suspicion attached to one who was proved, like the Chevalier Bayard, "without fear, without reproach."

We can tell.

Suppose a man to require a drill, for instance, or a tap, or a lathe tool—for all these things are needed in making machinery of any kind—he goes to the tool maker with his order, and says "make this or that." The tool maker is already busy with other work, and the man waits until his turn comes, possibly for half an hour. It is then discovered that for this job there is no steel of the right size, so a bar is sent for; two hundred pounds, more or less, has to be purchased to get twenty pounds from. The order goes to the dealer; the dealer sends it, not with lightning dispatch. The man wanting the tool to use is idle, the machine itself is idle, the work is delayed, and what was a simple want, by mismanagement grows into a costly matter. Doubtless the drill or the boring tool is broken after a short time, has to be renewed, and so the expense is increased. This is not a fancy sketch, but a thing that actually occurs every day in every shop in this country, where machines are used, to a greater or less extent. The remedy is simply to systematize the construction of tools, so that they may be had when wanted without waiting half a day. Three drills ready-made and kept on hand do not cost so much as it would to make one drill to order at short notice; so with taps or with any tool that is commonly used. When a man breaks anything, he knows the exact cost of it, and to make a simple cutter he is not required to count the cost of running an engine or the wages of every one immediately concerned in its fabrication.

It is a good sign to see tool factories starting up in different parts of the country, for it shows that managers of machine works are alive to the importance of these small items, and that if reliable goods can be obtained they prefer to purchase tools than to make them. We have noticed in the columns of the SCIENTIFIC AMERICAN for months past various illustrations of tools of different kinds adapted to machinists' and metal workers' use, inserted by different concerns, wholly unconnected with each other, each working with plans and objects of their own. It is with a view of promoting the general welfare of all that we direct attention to them now and in future.

What has been said of tools may apply equally well in principle to other departments—to employing cheap and inefficient labor in preference to skilled, at a fair price, and to other abuses that consume the profits rapidly.

RESIGNATION OF THE COMMISSIONER OF PATENTS.

It is announced by telegram from Washington that Hon. D. P. Holloway has resigned the office of Commissioner of Patents.

Mr. Holloway has held this important position for over four years, during which time the business of the office has largely increased. Like all other Commissioners he has encountered some opposition, but we do not hesitate to say that in our judgment he has discharged his duties faithfully, and generally to the satisfaction of those who have had claims before the office.

It is very much in his favor that he has always proved the steadfast friend of the inventor. In this respect his record is one of which he may, in his retirement, remember with satisfaction.

NEW COMMISSIONER OF PATENTS.

Hon. Thomas C. Theaker is strongly recommended to succeed Mr. Holloway as Commissioner of Patents. Mr. Theaker was formerly a Member of Congress from Ohio, of which State he is a resident, and was highly esteemed as a member of that body. Upon the establishment by Congress of the office of Examiners-in-chief, constituting a Board of Appeals in the Patent Office, Mr. Theaker was appointed by President Lincoln as one of the three Examiners of that important Board, which position he has since held. During this period he has acquired an extensive knowledge of the law and practice of the Patent Office, and is especially well qualified to fill the office of the Commissioner. A better and more satisfactory appointment could not be made.

AT the British Museum about 4,150 volumes are used in the reading room daily; the number of readers has been about 106,000, or 360 per diem. 38,842 volumes have been added to the library during the past year, of which 2,730 were presented, 28,426 were purchased, and 7,686 acquired by copy-right. 819 maps, charts and plans have been added, in 3,326 sheets, and 44 atlases complete. 2,378 pieces of music have been obtained. The total number of articles received by this department has been 72,214 of which 1,283 were received under the international copyright treaties. 300,000 stamps have been impressed on these articles.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING JULY 11, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

48,637.—Door Bell or Gong.—Horatio H. Abbe, Chatham, Conn.:

I claim the use of a sliding groove, or its equivalent, in combination with the clapper, E, and the spring, b, for the purposes specified.

48,638.—Foot Rest.—Charles S. Adams, Hillsdale, Mich.:

I claim, First, The combination of the section, C, and slides, a, with the spring catches, d, or their equivalents, constructed and arranged so that the section, C, or foot rest, may be raised or lowered to the desired hight, substantially as herein shown and described.

Second, The combination of the section, C, spring, E, and spring catches, d, arranged and employed in the manner and for the objects herein specified.

[This invention consists in making the top of a foot-stool or ottoman in three parts or sections, the center one being so arranged that it can be raised or lowered for the purpose of providing an adjustable foot-rest. The appearance of the stool or ottoman, when the foot rest is lowered, is not in the least marred or changed by the application of the invention.]

48,639.—Hot-air Engine.—Cyrus W. Baldwin, Boston, Mass.:

First, I claim in a hot-air engine the arrangement, substantially as described, by which a single cylinder is supplied on one side only of its piston from two or more furnaces, which are separate from each other as to the means for the reception in each of fuel and air, but which discharge their gaseous products of combustion into said cylinder, as stated, through a common valve chamber.

Second, Also providing at the top of the fire box of a hot-air engine a passage around the same for conducting the gaseous products of combustion to the cylinder, so as to cut off therefrom and from the valve chamber actual flame, and cause to deposit of solid matter, substantially as specified.

Third, Also the arrangement for supplying the air for the support of combustion, and to be heated to fill the cylinder, by passing the whole of it into the fire box above the fuel, instead of passing the whole or a portion of it through the fuel, as previously practiced.

Fourth, Also incasing the valve chest, and passing the cold air from the force pump on its way to the fire box into said casing and around, and for the purpose of cooling the chest, substantially as specified.

Fifth, Also the arrangement of the lower part of the cylinder without any metallic inner boundary, and of fire brick or other suitable non-conductor, supported by a metallic casing, substantially as specified.

48,640.—Railroad Switch.—Milton Ball, Canton, Ohio:

I claim, First, So constructing a railroad switch that when the operator opens it he will be unable to leave it without closing it again, substantially as described.

Second, Surrounding a railroad switch with an inclosure having one or more entrances, which stand open while the switch is closed, but which are closed in the act of opening the switch, substantially as described.

48,641.—Sheep Rack.—Milton Barnard, Unionville, Pa.:

I claim the pyramidal partition, B, extending upward beyond and between the ends of the pivoted sides, b b, for the purpose of forming two separate hoppers and troughs, substantially as herein described.

[The object of this invention is to obtain a trough by which a number of sheep may be fed equally, that is to say, each have an equal share of the feed.]

48,642.—Compound Explosive Shell.—Henry Barton, Baltimore, Md.:

I claim the construction and arrangement of the independent chambers, J, within an external shell, A, so as to form a central chamber or magazine, K, communicating with each fuse pipe, L, as herein described and for the purposes set forth.

48,643.—Truss for Bridges.—William Batchelder, Newburyport, Mass.:

I claim as my invention the truss made substantially as described, that is to say, of the rods, a a b b d d d d e e e e f f f f g g h h r r t t t t, the hangers, o p p q, and the connections, A A A A C C D E F F and G, arranged and applied together in manner as specified and represented.

And, in combination therewith, I claim the series of rings, c, or their equivalents, applied at the intersections or crossings of the rods.

I also claim the combination of two of the said trusses and two series of parallel rods, u u, diagonal rods, i k, and bent rods, l, arranged with the said trusses as specified.

48,644.—Measure for the Human Body.—George Beard, Salineville, Ohio:

I claim an extensible measure for the human body, applied thereto and operated substantially as herein described.

48,645.—Medicated Candy.—B. H. Bener and M. H. Burgess, Erie, Pa.:

We claim a medical compound, made as herein described.

[This compound or medicated candy is intended particularly to rectify coughs, or affliction of the lungs of any description; it is also a good remedy for bronchitis, sore throat, and similar complaints.]

48,646.—Feed-regulating Mechanism for Hoppers.—John S. Bodge, Bath, N. Y.:

I claim a hopper provided with a sliding slide, b, and operating as herein shown for the purpose of being raised and lowered to regulate the feed or the discharge of the contents of the hopper from the same, as set forth.

[The object of this invention is to obtain a means whereby grain and other substances may be fed from hoppers to the machine designed for them in greater or less quantity, as may be desired, and the feed regulated from a distance, that is, from stories below that in which the hopper is placed.]

48,647.—Pump.—John Boley, Baldwinsville, N. Y.:

I claim the concave extension wings, D', the flange, C*, the bar, E, securing the step to the flange, the whole arranged and operating substantially as and for the purposes herein set forth.

48,648.—Damper for Violins.—Aug. F. H. Braun, San Francisco, Cal.:

I claim the combination and arrangement of the springs, D K, with the sordine, C, as operated by the spring or lever, I, and button, E, substantially as described and for the purpose set forth.

48,649.—Straw Cutter.—Joseph Brockway, Cambria, N. Y.:

I claim the attaching the knife to the lower part of a pendulum or swinging frame, for the purpose as herein set forth.

48,650.—Shears for Cutting Paper.—Chas. Brombacher, New York City:

First, I claim the combination of a stationary shear, a moving cutter and a clamping bar, actuated by springs, to hold the material to the bed while being cut, as and for the purposes specified.

Second, I claim the combination of a stationary shear, a moving cutter, a spring clamping bar, and mechanism, substantially as specified, between the moving shear and the spring clamping bar, whereby the upward movement of the shear releases the spring clamping bar, substantially as set forth.

Third, I claim forming the clamping bar with a beveled edge next to the shears, for the purposes specified.

Fourth, I claim the sustaining slide rod, t, fitted substantially as specified, in combination with the spring clamping bar, for the purposes set forth.

Fifth, I claim the movable sustainer, v, in combination with an adjustable gage, e, for the purposes specified.

48,651.—Boot Counter Machine.—John Brooks and Charles F. Sylvester, North Bridgewater, Mass.:

We claim the combination and arrangement of the edge cutters, y y', the main cutter or knife, D, and mechanism for feeding the strip of leather to such cutters, the same being in order that such strip may not only be separated into counters, but each counter be reduced or trimmed on its opposite longer or curved edges, substantially as specified.

We also claim the combination of the rotary platform, C, and its elevating and turning mechanisms, with the stationary foot, B, the tilting knife, D, its stationary abutment, m, and movable supporter, P, the whole being arranged and the knife provided with springs, substantially as described.

48,652.—Governor Valve.—Oliver L. Brown, Manitowoc, Wis.:

I claim the combination of the projecting valve stems, d d', arms, F, screws, l l', conical valve, D, formed with trapezoidal openings, i, annular seat, H, with rectangular openings, h, steam chamber, B, inlets, a, and outlet, b, all arranged to operate as specified.

[This invention relates to a valve which is provided with a series of cavities and works in annular seat, which is surrounded by a steam chamber, and perforated with a series of apertures or slots corresponding in number and position to the cavities in the valve, in such manner that by turning the valve in its seat said cavities can be made to register partially or wholly with the apertures in the seat, and more or less steam passes through the valve.]

48,653.—Coupling for Carriages.—John Bundy, Irondequoit, N. Y.:

I claim the combination of the coupling with the reach from the rear axle by means of an arm or rod extending through the upper circular plate in such form that the plate revolves around it, substantially as above set forth.

48,654.—Corn Planter.—Robert Burns, New York City:

I claim the tubes, F, provided with vertical rods or a grating at their outer or rear sides, in connection with the adjustable seed retainers or holders, G, arranged to operate substantially as and for the purpose set forth.

I also claim the plates, I, in combination with the seed retainers or holders, G, all arranged to operate conjointly, substantially as described.

I also claim the wheel, N, provided with teeth, g h r, at one side, and arranged as shown so as to be readily thrown in and out of gear with the wheel, R, in combination with the levers, M O X, for operating the plates, I, seed retainers or holders, G, and knockers, Y Y, for the purposes set forth.

I further claim the frames, U, suspended by the pendents, m, in combination with the furrow openers, T, and adjustable coverers, consisting of the flaring plates, n, and plate, o, arranged to operate in the manner and for the objects specified.

[This invention relates to a new and improved corn planter for planting corn in hills and in check rows, and it consists a novel construction of the seed-distributing device, whereby the quantity of seed in each dropping may be varied as desired, the device prevented from choking or clogging, and the seed-distributing apparatus rendered inoperative whenever desired, as for instance in drawing the machine from place to place, turning the ends of rows, etc.]

48,655.—Seeding Machine.—Robert Burns, New York City:

I claim the perforated reciprocating slides, D, provided with pendent tubes, E, and having removable plates, D, placed within them, in connection with the adjustable or pivoted tubes, F, substantially as and for the purpose herein set forth.

48,656.—Car Coupling.—Samuel S. Cheney, Hillsboro, Ohio:

I claim the method of controlling the motions of the piston in the draw head by the shoulder in the rear of the head, B, and the pin, F, which traverses the slot, G, the whole arranged substantially as described and represented

48,657.—Cider Mill.—William and Lewis Clayton, West Philadelphia, Pa.:

First, We claim the combination of the cylinder, g, sectional pieces, f, adjustable metallic slips, h, with sharpened edges and flexible flap, d, in a cider mill, as and for the purposes herein set forth.

Second, The flexible flap, d, arranged as and for the purposes described.

[This invention relates to a peculiar arrangement of knives and scrapers for cutting the apple into thin slices or pieces, in connection with a flexible flap for cleansing the knives as they revolve, whereby the cider mill is rendered very effective and expeditious in operation.]

48,658.—Harvesting Machine.—Isaac H. Collar, Poughkeepsie, N. Y.:

I claim the application of the sleeve, D m, with the crank shaft, A, pitman, C, and sickle, B, to harvesting machines, substantially as and for the purpose herein described.

48,659.—Artificial Arm.—John Condell, Morristown, N. Y.:

First, I claim the appendage, Fig. 4, which is adapted to maintain its place by means of its auxiliary attachment, so as to afford two definite and practically rigid points, D' D'', to which the flexor and extensor straps or cords are to be attached, so as to produce those motions by the forward and backward movement of the stump.

Second, The cord, a c e, or its equivalent, with or without the intervening lever, d, and attached substantially as described, by which the forward motion of the metacarpus is obtained.

Third, I claim attaching the flexor and extensor cords or straps to points on the front and rear of the shoulder joint, so as to be brought into action by the forward and rearward motions of the stump.

Fourth, I claim the combination of the flexor and extensor straps with the rocking frame, L, or its equivalent, which connects by link or otherwise with the fore-arm.

Fifth, I claim the flexor spring, L, attached to the socket and to the rocking frame, L, or its equivalent.

Sixth, I claim the combination of the spring, N, with the arm, P, on the axial bolt, and the rocking frame, L.

Seventh, I claim the spring, Z, with its tendons, Y F, or their equivalent, and extending from a point in the fore-arm to a point back of the center of vibration of the metacarpus, substantially as described.

Eighth, I claim articulating the metacarpus to the end of the fore-arm by a pivoted point or points, so as to be moved in either direction by appropriate springs or cords, which are attached to the metacarpus at points on opposite sides of the axis of vibration.

Ninth, I claim constructing the fore-arm as described, with a sleeve portion, V, which is capable of rotation, so as to change the presentation of the hand.

Tenth, I claim operating the fingers or thumb by the motion, however induced, of the metacarpus.

Eleventh, I claim pivoting the frame piece, m, of the fingers to a point on the metacarpus, and the rods which, under the motion of the metacarpus, primarily induce the deflection of the fingers to a point on the fore-arm.

Twelfth, I claim pivoting the second joint of the frame pan, q, to a point on the frame piece, m, and the rod which gives the additional deflection due to the second joint to a point attached to or connected with the metacarpus.

Thirteenth, I claim giving the additional deflection due to the terminal section or first joint of each finger by a rod attached to it, and to a point on the frame piece, m.

Fourteenth, I claim governing the motion of the thumb by a rod attached to the end of the fore-arm, which, under the vibration of the metacarpus, influences the frame piece, x, and gives the deflection due to the second joint of the thumb.

Fifteenth, I claim giving the deflection due to the first joint of the thumb by means of the rod, y, which performs that office, as the frame piece, x, is vibrated by the rod, Z, when the metacarpus is moved.

48,660.—Artificial Leg.—John Condell, Morristown, N. Y.:

First, I claim the adjustable pad, B, or plate within the socket, for the purpose of adapting the capacity of the socket to the stump, substantially as set forth.

Second, The bridge piece, K, which is supported on the frame, G, and upon the bolt, F, and affording the superior point of attachment for the extensor spring, I i' i'', substantially as described.

Third, I claim the hamstrings, N N, arranged substantially as described and attached to the posterior portions of the thigh and leg, to act as checks to the forward motion of the leg, in combination with the arrangement for adjusting their tension.

Fourth, I claim the extension spring, consisting of the muscular or spring portion, I, the tendon, i', and the bifurcated tendon, i'', the insertion of the upper tendon being at the bridge piece, K, which bears up the knee belt, and the lower insertion being in the toe piece, substantially as described.

Fifth, I claim the construction of the ankle joint, consisting of the socket in the foot, and the ball, P, attached by its neck, and the iron frame, Q Q', to the leg, and having a stud upon it, fitting its appropriate recess in the socket in the foot, so as to prevent vibration in a horizontal plane, while leaving the joint free for motion in vertical planes, as described.

Sixth, I claim the elastic straps, a b, proportioned as to length and strength, substantially as and for the purpose described.

Seventh, I claim the yoke, Fig. 4, which derives its rigidity and freedom from tendency to displacement from its ultimate point of auxiliary attachment, from whence the straps proceed over the shoulders, so as not alone to bring the weight upon the frame work of the body, but also to enable the shoulders, by their motion, to influence the motion of the artificial limb.

48,661.—Wood-bending Machine.—Matthew F. Connett, Evansville, Ind.:

I claim the combination of the uprights, b, carrying rollers, a, the curved formers, J, and the sliding blocks, e f, arranged and operated substantially as described, for the purpose set forth.

48,662.—Instruments for Ripping Sutures in Cloth.—F. B. Converse, New York City:

I claim the implement for ripping seams herein shown, constructed substantially as above described.

[This invention relates to a very convenient and important implement, by means of which seams of sewing in cloth or other materials can be readily and with ease ripped, with no danger of cutting the material; it is applicable both to machine and hand sewing.

48,663.—Carpenter's Gage.—B. T. Currier, Boston, Mass.:

I claim ranging the adjustable stand, I, which carries the marking wheel, L, to traveres in the slot, G, of the gage bar, B, substantially as described.

48,664.—Photographer's Decanter.—G. W. Doty, Ravenna, Ohio, and E. A. and W. F. Stein, Portage, Ohio:

We claim the above-described decanter, when provided with the stop-cock tube and cork, substantially in the manner and for the purposes set forth.

48,665.—Hay-fork.—Charles L. Driesslein, Chicago, Ill.:

First, I claim in combination with an ordinary rigid fork and its handle, a hinged and swinging fork or shield, D, actuated by a cord or rope, substantially as and for the purpose described and represented.

I also claim weighting or overpoising the tines or arms of the swinging fork by means of the ball, E, or their equivalents, to cause it to fall with more readiness and quickness as and for the purpose described.

I also claim, in combination with the permanent and swinging forks, the arms, G, for preventing the fork from entering the material to be moved by it too far, and thus interfering with the free and unencumbered action of the swinging fork, substantially as herein described.

48,666.—Churn.—Worden Edmister and Stephen Johnson, Mount Vernon, Ohio:

We claim the dasher, C, composed of two parts, constructed as shown, connected together and applied to the shaft, D, so as to admit of being adjusted higher and lower thereon, substantially as and for the purpose specified.

[This invention relates to a new and improved dasher, and a particular means for operating the same, whereby butter may be produced from the cream in a short space of time, and with but a moderate exertion or expenditure of power on the part of the operator.

48,667.—Coupling for Shafts of Boring Tools.—James Esler, Brooklyn, N. Y.:

I claim preventing the lower section of the boring rod, A, from turning away or being disconnected from the rod, C, by means of the sleeve, E, and the key, H, the said key passing through an aperture in said sleeve, by and past one of the squares formed, or said section, A, as and for the purpose set forth.

48,668.—Flour Sifter.—Horatio Fairbanks, Boston, Mass.:

I claim the revolving shaft, C, carrying a series of angular projections, in combination with a box or hopper, A, and seive, B, substantially as and for the purpose set forth.

I also claim, in combination with the above, attaching a rubber strip to one or both sides of the seive, B, substantially as and for the purpose described.

48,669.—Excavator.—H. W. Farley, Hannibal, Mo.:

First, I claim the shaft, G, with its scoops, H, in combination with the block and tackle devices for raising, substantially in the manner and for the purpose described.

Second, The partially rotating scoops, operated by a lever or levers on the shafts, to adjust their position or discharge their load.

Third, I claim the combination of the crank, W, and its connecting gearing with the rope, S, and counterbalance weight, T, for raising the shaft, G, and its scoops.

48,670.—Corn Sheller.—G. W. Fitts, South Hampton, N. H.:

I claim the arrangement of the discharging throat, G, and its back board or part, X, with the curved chute, F, and the wheel, C, to operate as specified.

48,671.—Camp Bedstead.—Christian Fostensen, Hans Iverson and Charles J. Skow, Racine, Wis.:

I claim the combination and arrangement of the sacking, a, side bars, b b, short end pieces, c and d, bars, f and g, rod, l, plates, n n, arms, p and q, plates, t t, bars, y, and legs, u u, substantially as described.

Second, attaching the two ends of the mattrass or sacking used for the bedstead to and within a swinging frame of its sidebars, arranged and operating substantially in the manner and for the purposes specified.

[This invention relates to improvements in bedsteads, whereby when not in use they can be neatly folded up into a compact shape and thus be convenient for transportation or storage.]

48,672.—Apparatus for Distilling.—C. F. Frederici, New York City:

I claim a distilling apparatus, composed of a series of hollow drums, (two or more) connected by oblique pipes, and provided with gudgeons on which it revolves, substantially as and for the purpose set forth.

Also, the combination of the pipe, E, and hollow gudgeon, a', with the drums, C, with or without oblique pipes, D, constructed and operating substantially as and for the purpose described.

48,673.—Cock.—J. P. Gallagher, St. Louis, Mo.:

I claim, First, The tube, F, arranged relatively with the body, A, of the cock or faucet, and the chamber or barrel, D, and the valve, B, in connection with the tube, c, disk, G, and escape spout, H, substantially as and for the purpose specified.

Second, The groove, b, in the periphery of disk, G, when used in connection with the parts specified in the first claim for the purpose of affording an annular chamber around the disk, G, as described.

48,674.—Pipe Coupling.—Annin M. George, Nashua, N. H.:

I claim the combinations of the projections, heads or buttons, b b', of the bolts, B B', and the inclined surfaces, k k l l' k k' l l', with the two parts of the coupling, substantially as and for the purpose set forth.

48,675.—Chain Holder.—Samuel Gladding, Providence, R. I.:

I claim, First, The movable fingers, d d, in combination with the catch, b, and the mortises, c c, substantially as described and for the purposes set forth.

Second, The combination of the fingers, d d, jointed at, f, mortised at, c c, with the catch, b, provided with the pins, i, in connection with the wedge, h, constructed and arranged substantially in the manner described for the purposes set forth.

48,676.—Tool for Lifting Stove Covers, Etc.—Porter J. Gladwin, Boston, Mass.:

I claim the within described tool consisting essentially of the handle, A, with its stationary jaw, B, and slot, b, in combination with the movable jaw, C, and its arm, c', the whole arranged and operating as and for the purpose set forth.

48,677.—Band for Head Dresses.—Nathaniel Grant and George Downs, Providence, R. I.:

We claim the improved band for ornamental head dresses made of the material herein described as a new article of manufacture.

48,678.—Combined Lamp and Stove.—C. B. Guy, Lybrand, Iowa:

I claim a lamp combined with a stove and register in the manner substantially as herein shown and described, so that the smoke and odor emitted from the lamp may be carried off by the stove pipe, and the rays of light admitted into the apartment or shut off from the same when desired, substantially as set forth.

[This invention consists in combining a lamp with a stove in such a manner that the smoke and offensive odor emitted from the lamp will be carried of by the tube of the stove. The invention is more especially designed for sick rooms, as the odor from lamps is not only very disagreeable but also injurious to persons in ill health.]

48,669.—Gang Plow.—A. Hammond, Jacksonville, Ill.:

I claim, First, The segment rock, L, pawl, M, and foot lever, O, all arranged and applied to the plank or timber, D, and beam, A, substantially as and for the purpose specified.

Second, The button, P, when applied to the plank or timber, D, and used in connection with the rack, L, pawl, M, and foot lever, O, for the purpose set forth.

[This invention relates to a new and improved gang or trench plow and it consists in a novel construction and arrangement of parts, whereby the plows may be readily adjusted higher or lower as may be desired, and also readily raised temporarily out of the ground when necessary, as for instance turning at the end of the furrow or field.]

48,680.—Machine for Granulating Tobacco.—J. H. Harris, Newark, N. J.:

I claim the combination in a machine for granulating tobacco of the vibrating vessel, D, having open sides, with a corrugated roller revolving therein, substantially as above described.

[This invention consists in an improved machine for granulating or dividing the leaves of tobacco into minute divisions for smoking in pipes, wherein a corrugated beater roller is made to revolve within a vibrating vessel, whose sides are composed of wire cloth on a mesh of like character, so that the tobacco is broken up and delivered in small pieces, through the meshes of the wire cloth, into a box below.]

48,681.—Cryptographic Alphabet.—K. H. Hawley, Signal Corps, Army of the Potomac:

I claim a cryptographic alphabet, arranged substantially in the manner and for the purpose specified.

48,682.—Boot Heel.—Francis D. Hayward, Malden, Mass. and Pascal Stone, Charlestown, Mass.:

We claim the improved heel or parts, A B, as made with the dovetail connection, elastic as described, or with the circular or polygonal elastic dovetail connection as explained, the whole being so that the tread part, B, may be either revolved or adjusted relatively to the part, A, substantially as and for the purpose specified.

48,683.—Washing Machine.—John Heinlein, Galena, Ill.:

I claim, First, The air chamber, E, arranged relatively with the wash board, C, to operate in connection therewith, substantially as and for the purpose specified.

Second, The combination of the swinging rollers, e, wash board, C, and air chamber, E, all arranged and combined to operate in the manner as and for the purpose set forth.

[This invention relates to a new and improved clothes-washing machine of that class in which a swinging pressure roller frame is employed in connection with an elastic wash board. The invention consists in a novel construction and arrangement of the parts above specified in connection with an air chamber whereby the clothes are acted upon in the most efficient manner both as regards the pressure and friction to which the clothes are subjected as well as to the turning of the clothes in the suds box in order that the whole mass may be properly acted upon.]

48,684.—Flour Bolt.—Samuel Heflebower, Alexandria, Va.:

I claim making a radial prolongation, e, to the wings of the fan at the tail end of the horizontal or nearly horizontal bolt, the said radial extension of the wing or wings beyond the main portion of the fan being adapted to cause a current of air to be drawn through the bolt in the manner and for the purpose described.

Second, I claim the plate, N, fig. 3, in combination with the scooped shaped dippers.

48,685.—Disk Knives.—Anton Hehniger, New Haven, Conn.:

I claim the combination of two blades, B and C, with the spring, g, when the parts are constructed, arranged and fitted for use, substantially as herein described.

48,686.—Metallic Packing Boxes.—H. Z. Hopkins, San Francisco, Cal.:

I claim the tapering spilit or sectional lining, C, with expanding wedge, D, in combination wtth the box, A, and follower or cap, B, constructed and operating substantially as and for the purpose described.

48,687.—Machine for Making Wagon Wheels.—J. M. Howe, Portland, Oregon:

I claim the annular slide, G, with the ring, H, attached, and the latter provided with the arms, f, and the slides, g, in connection with the shafts, C C' and D, provided with cutters, C and C', all arranged substantially as and for the purpose herein set forth.

[This invention relates to a new and useful machine for manufacturing parts of wheels for vehicles, to wit. boring the felloes, sawing them to the correct level, tenoning the spokes at both ends, sawing them to the required length, and planing the felloes simultaneously, at three sides, and for planing and moulding other articles or work.]

48,688.—Carriage Top.—K. Thomas Hurlbert, Lyons, N. Y.:

I claim the combination of the pivoted socket, D, guide, a, and plate, C, so arranged as to allow the carriage top to be easily applied or removed and to be turned half way back, substantially as described.

I also claim the construction of the top consisting of the jointed bows, E E E' E', single toggle levers, G G, and suitable covering, A, the whole so arranged as to be compactly folded up, substantially as herein set forth.

I also claim the arrangement of the pivoted socket, D, and guide, a, of the seat, and the bows, E E", toggle levers, G G, and covering, A, of the top, substantially in the manner and for the purpose herein specified.

48,689.—Process of Curing Tobacco.—W. W. Huse, Brooklyn, N. Y.:

I claim the process, substantially as herein described, of curing tobacco, which process consists in subjecting it to the action of artificial heat and steam to induce the required fermentation until nicoline is revolved, and then stopping the further progress of fermentation by opening the packages and thoroughly drying every part, substantially as described.

48,690.—Binding Attachment to Reaping Machines.—John S. Jones, Covington, Ind.:

I claim, First, The combination of the rack, a, pinion, b, wheel, C, bevel pinion, d, curved wings, G, spring, A, hand, N, fork, T, and triangle, q, for the purposes set forth.

Second, I also claim the rod, I, or its equivalent in combination with twisting devices, J and K, for the purpose described.

Third, I also claim the arrangement of the sheaf bed, F, and its wings, G, in combination with the elevator, X, that lifts them, the device, Y, that operates that elevator, the rods, m, that lay over the sheaf bed holding the straw down while the wings press it.

48,691.—Pump.—Horace M. Keith, Commerce, Mich.:

I claim the reservoir, B, the valves, m and n, the cut off, S, the swipe pole, I, and the bucket, F, and the cylinder, C, the whole constructed, arranged and operating as and for the purpose, substantially as herein set forth.

48,692.—Piston Packing.—Edwin Kendall, New Lebanon, N. Y.:

I claim a packing for pistons consisting of a coiled spring, C, secured between the heads, B B, and adapted to operate substantially as herein described.

48,693.—Construction of Glass Cases.—E. D. Kinney and Caleb Wright, Philadelphia, Pa.:

We claim the within described case composed of the plates of glass arranged in respect to each other, held by the angular slips of the frame, and supported by the bent pieces, e, all substantially as described.

48,694.—Water Wheel.—Dr. J. Kindleberger, Springfield, Ohio:

First, I claim the springs applied to the opening and closing mechanism of the gates, where a plurality of gates are used for a single wheel, so that any one of said gates in case of being prevented from closing will not prevent the closing of the others as herein set forth.

Second, The arrangement of the bent arms, C, and levers, D, with the set screws, c, springs, g, plate, E, the pendant pins, h, the segment, G, and pinion, H, for operating the gates, B, as set forth.

Third, The arrangement of the buckets, l, of serpentine form, substantially as described.

Fourth, The cap, I, through which the shaft, j, of the pinion, H, passes, and which covers and protects the parts for opening and closing the gates as herein set forth.

48,695.—Damper.—John Knickerbocker, Hartford, Conn.:

I claim as a new improved article of manufacture, viz. The combination of the plates, b, with the damper, c, and adjusting rod, g, with their connections, substantially as and for the purpose described.

48,696.—Gang Plow.—J. H. La Boyteaux and C. A. Ashton, Jacksonville, Ill.:

I claim the adjusting of the axle, A, and consequently of the plow beams and plows, by means of the lever, j, connected with the axle through the medium of the chain, G, arranged substantially as described, for the purpose of adjusting the plows to suit the surface of the ground over which they work.

Second, The pivoted plow beams, N M, in connection with the bar, S, lever, T, and chain, N*, all arranged to operate in the manner substantially as and for the purpose set forth.

[This invention consists in a new and improved means for raising the plows out of the ground when required and also for adjusting the same so that they may be made to work in a proper relative position with the ground when the latter has an inclined or uneven surface.]

48,697.—Method of Preparing Flour and Meal for Transportation.—Edwin B. Larcher, New York City. Antedated June 28, 1865:

I claim the preparation of flour or meal for its preservation, by compressing the same, as and for the purposes specified.

48,698.—Self-acting Gate.—John Lee, Massillor, Ohio:

First, I claim sliding block, E, and pivot, d, or their equivalent, constructed and operating as set forth.

Second, Hinging the weight, H, to the top of the upper rail, in the manner described, or its equivalent.

Third, Operating the latch bar, G, by means of the picket, F', and slots, Y, or their equivalent, as set forth.

Fourth, The cast-iron piece, P, or its equivalent, operating as described.

Fifth, The combination and arrangement of shafts, L and N, and lever, Q, or their equivalent, operating as described

48,699.—Method of Forming Blank Clips for Singletrees.—Michael Loughran (assignor to himself and James B. Loughran), Pittsburgh, Pa.:

I claim a new article of manufacture, bars of iron having a raised brad running longitudinally on one or both sides, whether said brads are in the center of the bar or near one edge, and with flattened spaces on one or both sides at regular intervals along the body of the bar, made by depressing the brads in certain places, without regard to the shape of the brads, so as to form clips and clevises, in the manner herein shown.

48,700.—Vegetable Slicer.—Thomas Mason, Boston, Mass.:

I claim the combination of the series of conductors, b, with the single rotary cutter stock, d, arranged to operate together substantially as set forth.

48,701.—Portable Fence.—John M. May, Janesville, Wis., and Edwin B. Godfrey, Oshkosh, Wis. Antedated June 23, 1865:

We claim, First, Picket, C, or its equivalent, when used in constructing a fence, substantially as and for the purpose described.

Second, Braces, F F, or their equivalent, when made substantially as described, and used in combination with picket, C, or its equivalent, and base, B, substantially as and for the purposes described.

Third, A hinge or joint, when formed by means of picket, C, or its equivalent, and the perforated ends of rails, and supported by base, B, and braces, F F, substantially as and for the purpose described.

48,702.—Feather Renovator.—Wm. McArthur, Philadelphia, Pa.:

I claim, First, The casing, B, its shaft, C, and arms, h and h, in combination with the case, A, and the pipes, b c f and g, or their equivalents, the whole being arranged and operating substantially as and for the purpose described.

Second, The combination of the casing, B, chamber, d, and perforated or gauze plate, e,

Third, The frames, D and E, with their gauze or perforated plates adapted to the two halves of the casing, B, substantially as and for the purpose herein set forth.

Fourth, The long and short tapering arms, h h', arranged on the shaft, C, as set forth.

Fifth, The combination of the steam-tight box, A, and its pipes, f and b, or their equivalents, with the casing, B.

48,703.—Carpenter's Gages.—James McCrum, Locust Grove, Ohio:

I claim the employment or use of the loose head, D, and spring, E, or its equivalent, in combination with the bar, B, and adjustable heads, A C, constructed and operating in the manner and for the purpose substantially as herein shown and described.

[This invention consists in the employment or use of a loose head and spring, or its equivalent, applied in combination with the adjustable head and bar of a gage, in such a manner that by the action of said spring and loose heads the cutters or marking points will be guarded when the gage is used to mark any material.]

48,704.—Device for Cutting Cornstalks on the Ground.—Thos. W. McDill, Perry, Ill.:

I claim the knives, E, attached to triangular heads, D, keyed on a shaft, C, which is placed within a suitable frame, A, and all arranged to operate in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved device for cutting down standing cornstalks in the field, and into pieces of such length that they may be plowed under the soil with an ordinary plow. It consists in the employment or use of a suitable frame, provided with a draught pole, and a shaft having trylateral heads upon it, to which knives are attached at the angles or corners, all being arranged in such a manner as to operate very efficiently for the purpose specified.]

48,705.—Wool Press.—T. N. Morse, Grattan, Mich.:

First, I claim a machine for binding fleeces of wool, constructed and operated as shown, having bands, C, which are attached to and detached from the windlass by means of a bar, W, and groove, Y, substantially as and for the purposes above set forth.

Second, The combination of the side leaves, a a, transverse leaves, C', and grooves, d' d', all constructed, arranged and employed, substantially as and for the purposes set forth.

[The object of this invention is to put up fleeces of wool in square or nearly square forms, so as to be easily handled, and be capable of being packed for storage or transportation in less space than is now required.]

48,706.—Apparatus for Carbureting Air.—J. F. Brichard, Milwaukee, Wis.:

First, I claim the vertical tubes, b, for exposing the fluid of the hydro-carbon to the current of air, substantially as herein recited.

Second, The arrangement of the vertical metal tubes, c, or their equivalents, in relation to the tubes, b, as herein described.

48,707.—Pump.—Aron Carver, Little Falls, N. Y.:

I claim the piston, constructed substantially as described; that is to say, with a supplementary upper valve, restraining the downward pressure of the contents of the piston rod or pump tube upon the lower valve of the piston, substantially as described and represented.

Second, I also claim so fitting the piston rod of a double-action pump to the working cylinder thereof, as that it can be detached and withdrawn thereout and replaced thereon at pleasure, automatically, by increasing the length of the stroke substantially as described.

Third, I also claim separating the cylinder of a pump from the pump tube above by a removable inner collar, within which the piston top works, and which is capable of being detached, so as to allow the piston to be withdrawn and replaced again after the piston is replaced, by means substantially as described.

Fourth, I also claim connecting the valve box, I, forming the lower part of the working cylinder to the outer cylinder, A3, by means of the screw, p, constructed and applied substantially as above described.

48,708.—Dental Hammer.—James C. Dean, Chicago, Ill.:

I claim, First, The combination of the hammer, D, with the device for holding dentists's plugging points, substantially as described.

Second, Providing for regulating the force of the blow of a hammer when the latter is applied to the holder of a plugging point, by the means substantially as described.

Third, The combination of a tool holder, c, spring hammer, D, and the device or devices for actuating said hammer, substantially as described.

48,709.—Pipe Coupling.—Chas. W. Emory, Dorchester, Mass.:

I claim the combination of the thimble, a, with the screw cap, c, constructed and operating as herein described.

48,710.—Condenser.—Addison C. Fletcher, New York City:

I claim the arrangement of the fan, G, or its equivalent, and the inlet openings, a a, of the air box, B, substantially as herein described, in relation to the upright steam radiators, A A, of an apparatus for condensing steam and heating air, whereby there is produced over the surfaces of the said radiators an artificial upward circulation, in which the natural upward circulation is taken advantage of, substantially as herein set forth.

48,711.—Distillation of Alcohol, Etc.—Alexander Fries, Cincinnati, Ohio:

I claim the mode substantially as set forth of distilling purified spirits direct from the mash.

48,712.—Cooking Range.—E. G. Niles, Cincinnati, Ohio:

I claim, First, The supplemental fire-grate, E, fitted in the top plate of the range directly over the fire-chamber, B, and supplemental grate, E, substantially as described.

Second, The water chamber, G, cast with the top plate, D, and placed in relation with the fire chamber, B, and supplemental grate, E, substantially as described.

Third, The arrangement of the flues, b c, provided with partitions, d, substantially as and for the purpose specified.

[This invention relates to certain improvements in cooking ranges, whereby air may be heated for warming apartments other than that in which the range is placed, and an economical water-heating attachment obtain and perfect control over the fire, so as to economize in fuel, and to heat perfectly the ovens for baking purposes.]

48,713.—Drying and Preparing Crucibles.—Geo. Nimmo, Jersey City, N. J.:

I claim, First, Drying and preparing crucibles, by gradually moving them from the cool part of a flue toward the fire, either inside or outside said flue, on a carriage, or shifted by hand.

Second, The construction of a flue, in combination with carriages, as described, and for the purpose specified.

48,714.—Manufacture of Gas.—Chas. Noble, New York City:

I claim the employment or use in the manufacture of gas of lumps produced from coal dust or waste coal, substantially in the manner and for the purpose set forth.

48,715.—Wheel for the Propulsion of Vessels in Shoal Water.—Otia Olds, Aurora, N. Y.:

I claim the combination of the traction or ground wheel, H, with the compound frame, A B (including the hand wheel, I, and lifting ropes and pulleys), so that a purchase may be obtained to lift upon the bow of the boat, substantially as described.

48,716.—Stove Pipe Drum.—Joseph C. Paine, Dubuque, Iowa:

I claim the combination of cone, A2, within the drum, with the hot air chamber, B" B", the tubes or pipes, D" D" and E" E", the double deflectors, G" G", and the double damper, F1 F2, for the purpose and in the manner set forth.

48,717.—Pen Distributor.—Stephen A. Potter, Philadelphia, Pa.:

I claim the peculiar construction and combination of a case of drawers, so arranged with partitions, H H, divisions, A A, catches, C C, or their equivalents, for the purpose and in the manner substantially as shown and described.

48,718.—Washing Machine.—S. Safford Putnam, Dorchester, Mass.:

I claim a receptacle having a series of buckets so arranged and inclined upon its sides as that the series on one side shall incline upward, while the series on the opposite shall incline downward, and the series on the bottom incline from right to left, while the series on the top shall incline from left to right, so as to form buckets for dipping up and throwing the water over the clothes, as well as to turn and rub them, as herein set forth.

48,719.—Preparation of Dessicated Vegetable Extracts.—William J. Rand, Brooklyn, N. Y.:

I claim as an improvement in the process of obtaining dessicated

or highly concentrated juices or soluble extracts of animal or vegetable substances, first obtaining the juices or soluble extracts of such substances by heating or boiling them under a pressure greater than that of the atmosphere, and afterward straining and concentrating the juices or extracts so obtained by evaporation in vacuo, substantially as herein described whereby I am enabled to obtain in the concentrated or dessicated product all the soluble or reducible matters contained in the substances.

I also claim forcing the juices, extracts or reducible substances obtained by the digestion of animal substances through strainers, by means of the pressure of steam in the digester, substantially as herein specified.

I also claim the steam pipe, H, and its cock, a, and the stop valve or cock, G, applied in relation to each other and to the digester and receiver, and in combination with the pipe, C, substantially as and for the purpose herein specified.

And I further claim the combination of the digester, A, pipe, C, one or more strainers, E, receiver, D, and vacuum pan, I, the whole arranged and operating substantially as and for the purpose herein specified.

48,720.—Pump.—Franklin Ranson, Buffalo, N. Y.:

I claim the arrangement of the inlet valves, I I', and the divided chamber, C, having two compartments of greater capacity than the displacement of the piston, in combination with each other and with the cylinder of the pump, substantially as and for the purpose herein specified.

48,721.—Cock.—Joseph Regester, Baltimore, Md.:

I claim, First, The elastic capsule as arranged with the valve stem of a stop cock, substantially as described.

Second, Seating the lower end of a valve stem loosely upon a valve, d, having its support upon a soft packing, substantially as described.

48,722.—Ventilating Apparatus.—E. Y. Robbins, Cincinnati, Ohio:

First, I claim the arrangement for warming the floor or portions of the floor by causing the hot air from the furnace to circulate through a hot air chamber, C, and return to the bottom of the furnace through the return pipe or flue, D, subtantially as set forth.

Second, I claim the construction of the outer fresh air or warm air channel, x, Fig. 1, entirely separate and distinct from the inner or hot air channel, y, the air in the latter, heated by contact with the hot surface of the iron, being excluded from the room, and only used for carrying heat to the hot air chamber beneath the floor or in the wall, while the air from the former, x, being warmed entirely by contact with the outer surface of the brick or earthen wall or casing, a, is conducted into the room for respiration.

48,723.—Apparatus for Curing and Drying Fish.—Benjamin Robinson, East Gloucester, Mess.:

I claim the combination with a fish flake of a screening frame, arranged to operate substantially as and for the purpose set forth.

48,724.—Water Wheel.—Timothy Rose, Cortlandville, N. Y.:

I claim the central angular floats or brackets, b b, in connection and combination with the reversed end brackets, e e, as above set forth, and working in the manner herein described.

48,725.—Winding and Setting Watches.—Henry Rothfelder, New York City:

I claim, First, The combination of the winding lever with the ratchet wheel and spring barrel, in the manner specified.

Second. I claim the shank fitted to slide in a mortise through the periphery of the case, in combination with the winding lever, spring barrel and ratchet, as set forth.

Third, I claim the arm or crank, z, affixed to the square for the minute hand, by which to set the watch, as specified.

48,726.—Chronometer Escapement.—Henry Rothfelder, New York City:

I claim the arm, J, jointed to the lever, F, and provided with a spring, as set forth, in combination with the change pin, D, detent, E, and escapement, as specified.

48,727.—Pocketbook.—Louis Saarback, Philadelphia, Pa.:

I claim the elastic metal band or strip, B, combined with and arranged in respect to a pocketbook or portemonnaie, in the manner described, and having bent ends adapted to each other, as and for the purpose set forth.

48,728.—Process of Imparting Age to Wines.—John Searle, San Francisco, Cal. Antedated June 15, 1865:

I claim the introducing the heat by steam or otherwise to the wine itself by means of metallic pipes or chambers passing through the casks or vessels, substantially as set forth.

48,729.—Projectile for Rifled Fire-arms.—Christian Sharps, Philadelphia, Pa.:

I claim the within described projectiles, having a body tapering from the rear toward the front end, in combination with the wedge-formed projections, a, the whole being constructed and adapted to the bore of the barrel and to the case, B, substantially as and for the purpose herein set forth.

48,730.—Low Water Signal.—Thomas Shaw, Philadelphia, Pa.:

I claim the described apparatus, in combination with described animal or vegetable substance, when used for the purpose set forth.

48,731.—Flax-pulling Machine.—John Silvers, Lambertsville, N. J.:

I claim, First, The use of one or more elastic belts or bands, made of india-rubber or gutta percha, or of any of their respective elastic compounds, or of any other suitable elastic material, for the purpose specified.

Second, Coating the drum between which and the belt the plants are clasped, as described, with a sheet or surface of india-rubber or any other suitable elastic material, for the purpose specified.

Third, The use of the covered bar. X, attached to or forming a part of the platform of the machine, and arranged with regard to the drum thereof by which the plants are pulled substantially as herein described and for the purposes specified.

Fourth, Passing the elastic belt around a pulley or pulleys, when fixed within the frame, a, and adapted to be turned by means of the shaft, b, and retained in the desired position by the ratchet wheel, c, and pawl, a, whereby the tension of the said elastic belt may be varied, as described.

[This invention relates to some important improvement in flax or ihemp gathering machines whereby their effectiveness in operation s greatly increased and the flax is pulled or gathered with no injury to its fiber.]

48,732.—Petroleum Stove.—Hamilton E. Smith, Cincinnati, Ohio:

First, I claim the series of petroleum or coal oil burners, B B' B'' B''', in connection with a corresponding number of separate hot air chambers or series, G and N, having ventages for spent air at their bottom portions only, substantially as set forth.

Second, I claim in connection with two or more independent burners, B B', the oven, G, capable of vertical subdivision in the manner and for the purpose explained.

Third, In the described combination with a petroleum stove, I claim, in this connection, the tubular hot air chambered boilers, whose ventage for the spent air is at the bottom of the air chambers, as set forth.

48,733.—Fruit Dryer.—Adam Snyder, Clyde, Ohio:

I claim the employment of one or more fruit-drying sections in combination with the regulating diaphragm, substantially in the manner and for the purpose herein shown and described.

This invention relates to a novel arrangement and construction of a fruit-drying apparatus to be applied to cooking stoves, etc., whereby the currents of heated air passing through it can be regulated at pleasure, and the fruit dried with the utmost dispatch and economy.]

48,734.—Meat Chopper.—Alfred F. Spaulding, Winchendon, Mass. and Salmon M. Scott, Worcester, Mass.:

We claim as our invention in the above described meat chopping machine the combination of the four cranks, k l m p, and the connecting rod, a, or the mechanical equivalents thereof, with the remainder of the mechanism, or its equivalent, for operating the knives, the whole combination being productive of a compound motion of each knife, substantially as described.

We also claim the combination of the plow, g, or the same and the guard, r, with the rotary tub and one or more knives provided with mechanism for moving such knife or knives up and down in the tub.

48,735.—Horse Collar Fastener.—A. Steinbach, Evansville, Ind.:

I claim the plate, A, attached to one side or part of the upper part of the horse collar, and provided with the slot, C, having an enlarged part, and an inclined ledge, c, at each side as arranged with the plate, D, attached to the other side or part of the collar, and having a bar or arm, E, provided with a projection or lip, g, at each side of its outer part, substantially as and for the purpose set forth.

[This invention relates to a new and improved lock or fastening for connecting together the upper ends of a horse collar. The object of this invention is to obtain a lock or fastening of the kind specified which may be readily manipulated, that is to say, fastened and unfastened, and which may be constructed and applied at a trifling expense and be superior to the buckles and straps hitherto employed for such purpose,]

48,736.—Sleigh.—Isaac Stephenson, Maranett, Wis.:

First, I claim hinging the ends of the runners to each other, substantially as herein set forth and shown.

Second the guide bars and traversing pieces constructed and operated as herein recited and shown in combination with the hinging of the runners to each other, as herein described.

48,737.—Water Wheel.—J. E. Stevenson, New York City:

I claim the curving of the lower parts of the buckles, K, of the wheel, substantially as and for the purpose herein set forth.

Second, The exposing of the lower parts of the buckets by having the rims, m m, of the wheel at their lower ends cast or formed with recesses, substantially as described to admit of a free lateral discharge of the water from the issues.

Third, The spiral or coil shaped step, G, in connection with the tubular shaft, E, fixed spindle, A, and screw, H, with or without the bearing, J, substantially as and for the purpose specified.

Fourth, The laterly enlarged helix, B, provided with the beveled or inclined plates, l l, or their equivalents, for the purpose set forth.

Fifth, The employment or use of a screw, J, when applied to or used in connection with a wheel provided with a tubular shaft and a helix, in such a manner that the joint or space between the wheel and helix may be regulated as occasion may require.

Sixth, The combination of the wheel, d, provided with the buckets curved at their lower ends or issues and laterally exposed, the tubular shaft, E, fixed spindle, F, screw, H, and bearing, J, all arranged substantially as described.

48,738.—Coal Stoves.—Thomas L. Sturtevant, Boston, Mass.:

I claim the improved stove, as constructed not only with the radiator, B, and smoke space, D, about the same, arranged with the fire-place, T, and ash-pit, F, as specified, but as provided with a series of air-pipes, H H H, leading into the radiator and going through the fire-place, and with respect to the fire-proof lining thereof, substantially as specified.

And, in combination with the stove so made, I claim the series of lateral air-pipes, b b b, leading out of the lower part of the ventilator and opening through the sides of the case, as specified.

48,739.—Furnace for Melting Metals.—Wm. A. Sweet, Syracuse, N. Y.:

First, I claim so constructing a melting furnace that the temperature of the crucibles can be increased from a minimum to a maximum degree by transferring them from the cooler to the hotter chamber, substantially as described, and for the purposes set forth.

Second, I claim the combination and arrangement of the conical grate and feeding aperture, substantially as described, and for the purposes set forth

48,740.—Process for Tanning.—William E. Terry, Wyoming, N. Y.:

I claim the process of tanning by means of liquors composed of the several ingredients herein named, when combined in the projections and employed substantially in the manner herein described.

48,741.—Piano-forte Action.—Jonathan H. Tibbets, Omaha City, Nebraska Territory:

I claim the use in piano-forte actions of a rotating wheel, arranged and operating substantially as and for the purpose specified.

[This invention relates to piano-forte actions and consist of a novel arrangement of the parts composing them, whereby a much quicker, easier and better feeling action is obtained than those hitherto in use, the importance of which is obvious.]

48,742.—Hay Elevator and Stacker.—A. W. Tooker, Harvard, Ill.:

I claim, First, The combination of the crane beams, g g, with a tripod, which is supported upon a foundation frame, when said beams are supported by and applied to their frame substantially as described.

Second, The arrangement of the rope, h, upon a stacker which is constructed without a central turning post, in such manner that the movements of the horse can be made to effect the raising of the load and the turning of the crane arms, substantially as described.

Third, The use of an adjustable hitching hook, A, in combination with a crane, g g, or its equivalent, and the rigging, h, arranged to operate substantially in the manner and for the purpose described.

48,743.—Wick Trimmer.—Cyrus L. Topliff, New York City:

I claim, first, The combination of the fixed cutter, m, and movable cutter, f, arranged in parallel planes, and operating substantially in the manner and for the purposes specified.

Second, In combination with the aforesaid cutters, f, and m, I further claim the handle when so pivoted as to move in a plane parallel or coincident with that of the knife, f.

48,744.—Artificial Building Block.—George E. Van Derburgh, New York City.

I claim as a new article of manufacture blocks of artificial stone, formed substantially in the manner herein set forth.

48,745.—Silicated Building Block.—George E. Van Derburgh, New York City.

I claim as a new article of manufacture a silicated building block, formed substantially in the manner herein set forth.

48,746.—Artificial Stone.—George E. Van Derburgh, New York City.

I claim my specified improvement in the production of blocks, tubes, tiles, and other articles of artificial stone, by the use of finely pulverized sand, marble, or other equivalent, analagous substance in combination with the other materials employed in the formation of such artificial stone, for the purpose of filling the interstices between the individual particles thereof, substantially as herein set forth.

48,747.—Solution for Saturating Natural and Artificial Stone.—Geo. E. Van Derburgh, New York City:

I claim the within described silicated composition for the purpose of saturating natural and artificial stones, or as an ingredient in the formation of the latter, substantially as herein set forth.

48,748.—Stump and Grub Extractor.—Izaak Van Kersen, Kalamazoo, Mich.:

I claim the combination of the grub or stump pulling lever, L, and its attachments, with the two-horse cart or dray, the whole being arranged, constructed and operated, substantially as and for the purposes herein specified.

48,749.—Windows.—Sigourney Wales, Boston, Mass.:

I claim the combination and arrangement of the bar, D, and its fastening bolts and catches, or their equivalents, with the window frame and the sash, the same being for the purpose as specified.

I also claim the combination of the flange or rib, f, with the bar, D, and the sash, applied together and to the window frame, as described.

48,750.—Corn Harvester.—Samuel Ward, Lane, Ill.:

First, I claim the bars or beaters, J J, arranged to operate in vertical planes in front of and above the sickle, D, substantially as and for the purpose specified.

Second, The arms, K K, arranged to operate in horizontal planes, and in the described relation to the sickle, D, for the purpose set forth.

Third, The bed, G*, composed of the two shafts, g g, provided with the arms, h, and arranged with cords or chains, H H, for the purpose of discharging the cut cane or corn in gravels from the machine, substantially as described.

Fourth, The arrangement of the bars or beaters, J J, arms, K K, in combination with the sickle, D, and bed, G*, with or without the guard, N, combined and arranged to operate in the manner substantially as and for the purpose set forth.

Fifth, The knife, P, arranged to operate at the rear of the bed, G*, substantially as and for the purpose specified.

48,751.—Coal Stove.—Marshall D. Wellman and James Old, Pittsburgh, Pa.:

First, I claim making the fire-pot of close stoves with its greatest diameter at the level of the fire-bed or grate, and contracting upwards, substantially as and for the purposes hereinbefore described.

Second, The use in close stoves, in combination with a fire-pot constructed as hereinbefore described, of a double perforated grating, the lower part of which is stationary, the upper part turning thereon, for the double purpose of raking the fire and regulating the admission of air to the fire, substantially as hereinbefore set forth.

48,752.—Fire-place.—Marshall D. Wellman and James Old, Pittsburgh, Pa.:

First, I claim the use of recesses in the back and side walls of the fire-place, or in either of them, the top of which is below the level of the top of the fire-basket, in combination with flutes in the fire walls, for the purpose of preventing the packing of the fuel at the back and sides of the fire, and thus giving the air access to the back part of the fire, and allowing it to pass up the flutes so as to mingle with the unconsumed gas and smoke, substantially as described.

Second, The combination of a low grate or fire-basket, p, having slats between its bars, with the air spaces or recesses, v, in the back wall and overhanging back plate, d, for the purpose hereinbefore described.

Third, The arrangement of a hot-air chamber or chambers in the back and side walls of a fire-place, and the sloping or overhanging back wall and air passages in the rear of the fire chamber, for the purpose of more readily heating the air passing through such chambers to warm the apartment, substantially as hereinbefore described.

Fourth, The use of one or more hot-air chambers, constructed substantially as described, and placed in the throat of the chimney, so that the smoke and hot-air passing up the chimney shall play around or upon them, and thereby heat the air passing through them, for the purpose hereinbefore set forth.

48,753.—Construction of Soap Frames.—Daniel Whitaker, Roxbury, Mass.:

I claim, as a new and improved article of manufacture, a soap frame, made of wrought iron, having its side plates corrugated, and formed in two parts or sections, substantially in the manner described and for the purpose specified.

[This invention relates to a novel manner of constructing soap frames, whereby much strength is secured, and its buckling or twisting from the weight and heat of the soap contained in it obviated; and also, it is much less in weight and more convenient to handle than the styles heretofore used.]

48,754.—Toy Gun.—Newton P. Whittelsey, West Meriden, Conn.:

I claim, first, The combination of the barrel, b, enlarged at its inner end, arranged within the stock, a, having the depression, t, with the ferrule, i, substantially as and for the purpose described.

Second, I claim as an improved article of manufacture of a toy gun, the combination of the stock, a, barrel, b, spring, c, rod and hammer, d, e, with the ferrule, i, arranged and operating substantially as described,

48,755.—Knife Polisher and Grinder.—George L. Witsil Philadelphia, Pa.:

I claim, first, The arrangement and construction of the frame, A a, with the rubber springs, g g, discs, C C', h, and shaft, c, substantially in the manner described and represented.

Second, The arrangement of the bevel-faced grindstone, B, with the several parts named in the first claim, as herein described.

48,756.—Ruler and Paper-Cutter.—Joseph Woodward, (assignor to J. S. Uttey), New York City.

I claim the ruler and paper-cutter herein described, having a straight outer ruling edge, a, and two united straight inner cutting edges, b c, forming a continuous rectangular cutting edge.

48,757.—Manufacture of Felted Cloth.—Charles T. Young, Lawrence, Mass.:

I claim the felted cloth herein described, the same being a new article of manufacture.

48,758.—Cultivator.—L. G. Youngs, Wilmington, Ill.:

I claim the plow-bars, E E E' E', and shaft, J, provided with the loops, I I, and arms, f, f, all arranged and applied in connection with the levers, K', to operate in the manner substantially and for the purpose set forth.

[This invention relates to a new and improved device for planting corn, and also for plowing and cultivating corn and other crops which are grown in hills or drills, and it relates to a new and improved means for adjusting the plows laterally, so that the same may be made to conform to the sinuosities of the rows of plants, when the device is used as a cultivator, and also in a novel and improved seed-dropping device when the device is used as a corn planter.]

48,759.—Revolving Mortising Tool.—William Zimmerman, Quincey, Ill.:

I claim the new article of manufacture described, to wit, a rotating mortising or slotting tool with teeth on the cutting edges, substantially as described.

48,760.—Lamp.—Joseph K. Andrews, Antrim, Ohio, assignor to himself and J. C. Tilton, Pittsburgh, Pa.:

I claim the application of the two cylinders, C D, made of perforated sheet metal, or other equivalent material, and secured one inside of the other, on a lamp-burner, A, of the ordinary construction, substantially as and for the purpose herein shown and described.

[This invention consists in the employment or use of two perforated cylinders, one inside the other, and connected together by wires extending from the inner to the outer cylinder, in combination with an ordinary kerosene lamp burner, in such a manner that by the air admitted through the perforations of the two cylinders, and by the draught occasioned by the same, the smoke and surplus carbon is consumed, and a burner is obtained which gives a brilliant and odorless light, without the use of the ordinary glass cylinders.]

48,761.—Annealing Furnace.—Edwin Bennett (assignor to himself and W. T. Gillinder), Philadelphia, Pa.:

I claim, first, Placing the furnace so as to discharge its heat at such a point between the feed and discharge ends of the leer, as that the heat shall be graduated towards both ends, for the purpose described.

Second, The use of the trays, F, for the purpose of receiving the ware and for charging and discharging the leer.

48,762.—Manufacture of Water-proof Fabrics.—Thomas Crossly, Bridgeport, Conn., assignor to The American Water-proof Cloth Company, Brooklyn, N. Y.:

I claim, first, A fabric composed of a back of linen, jute, or other material, having a coat of rubber or other gum, upon which is fastened a face of yarn, of silk, worsted, woolen, fur, or other material, the same being looped or tufted as described.

Second, A fabric made as described, and colored, dyed, or printed, or colored and dyed and printed, either before or after the face is applied, in the manner and for the purposes herein set forth, as a new article of manufacture.

48,763.—Tool Stock.—William W. Draper, (assignor to himself and Alonzo Parke.), Greenfield, Mass.:

I claim the combination of the screw-shank, constructed as specified, and conical wedge, with the inclosed nut and clasping jaws, f, the whole arranged to operate as described for the purpose set forth.

I also claim the peculiar shape of the arm-piece, B B', as shown for the purpose set forth.

48,764.—Sizing and Finishing Covered Skirt Wire.—W. E. Frost (assignor to I. Washburne and P. L. Moen), Worcester, Mass.:

I claim sizing and finishing covered wire (or covering strips of metal of considerable length) in causing it to pass continuously through a sizing mixture, and over rolls, or their equivalents, while subjected to heat, and thence on to a reel, or other receiver, substantially as described.

48,765.—Sizing and Finishing Covered Skirt Wire.—W. E. Frost (assignor to I. Washburne and P. L. Moen), Worcester, Mass.

I claim passing the wire through the starch or size, and thence directly in contact with ironers or polishing surfaces substantially as described for the purpose set forth, whence it may be passed over rolls and heaters previous to its being reeled.

48,766.—Sizing and finishing Covered Skirt Wire.—W. E. Frost (assignor to I. Washburne and L. P. Moen), Worcester, Mass.:

I claim causing the covered or braided wire to pass from the supply reel, through the the "sizing" medium, and back and forth over drums, and thence back through the "sizing" medium again, to the second coat, and so on, any number of times desired; for the purpose of applying successive coats of "size" one over the other, in the manner substantially set forth.

48,767.—Mast Coat.—Andrew J. Gove, San Francisco, Cal., assignor to himself and William Gerard, New York City.:

I claim the metallic shield, E, and the flexible joint formed by the rings, G G', or their equivalent, attached to the shield and the deck respectively by the metallic rings, S" S", or in any other suitable manner, substantially as doscribed, and for the uses and purposes hereinbefore set forth.

48,768.—Beehive.—D. S. Gray (assignor to himself and M. H. Messer), Onorga, Ill.:

In combination with the inclined bottom, B, and sliding-door, E, constructed and arranged as described, I claim the slides, D, for facilitating the removal of filth, &c., from the hive, as explained.

48,769.—Machinery Clutch.—T. F. Hammer, Branford, Conn., (assignor to Gilbert J. Hine, New Haven), Conn.:

I claim, first, The combination of the clutch, E, and bar, G, when constructed and arranged with the tongue, c, or its equivalent, to operate in the manner and for the purpose specified.

Second, The combination and arrangement described of the clutch, E, inclined groove, d, and tongue, c, substantially as and for the purpose specified.

48,770.—Rotary Air Pump.—George B. Hill (assignor to Ellis S. Archer), New York City.:

I claim the combination in a rotary air or gas pump of the buckets, M, curved as described, so as to gather in the air or gas, with the space or chamber, O, substantially as described and to the effect set forth.

48,771.—Paddle Wheel.—G. Martin, (assignor to himself, and Watson Sanford, Thomas M. Davis, L. H. Walton), Philadelphia, Pa.:

I claim the smooth-faced friction slide or roller, d', on each of the floats or paddles, D D, and the smooth-faced, irregularly curved bearing E, on the vessel; the said parts being constructed and arranged to operate together substantially as and for the purpose described.

48,772.—Apparatus for Carburetting Air.—Patrick Mihan (assignor to Oliver P. Drake), Boston, Mass,:

I claim as my invention or improvements in the above described air-forcing apparatus the construction of each bucket educt with the pointed triangle or tapering form substantially as and so as to operate as described.

I also claim the arrangement of the back of each bucket, relatively to the shell of the drum and the educt of the said bucket, the said back in such case springing from the base of the educt and being arranged at an acute angle, or substantially so, with such educt, the whole being as and for the purpose specified.

I also claim the arrangement of the several bucket educts, viz., so that one may lap or extend by that or those next contiguous to it, substantially as and for the production of results as specified.

48,773.—Grates for Cooking Stove.—James B. Clarke (assignor to S. H. Burton & Co.), Cincinnati, Ohio.:

I claim, First, In the described combination, the stationary grated bottom, A B C C', and the folding grate, E D D', or their equivalents, for a convertible wood and coal fire-place, as set forth.

Second, The stationary grates, B and F, and the hinged and folding grate, E, combined and operating as set forth.

Third, The parts A B, C C', D D', E F and G, or their equivalents, arranged and combined to form a convertible wood and coal fire-place, as herein described.

48,774.—Fence.—David L. Pettegrew, (assignor to Sylvester Davis and Jacob Smith,) Claremont, N. H.:

I claim the double posts, B, with the key, D, and the adjustable brace, C, combined and arranged substantially as and for the purposes specified.

48,775.—Revolving Fire-arm.—Louis C. Rodier, (assignor to Samuel Norris,) Springfield, Mass.:

I claim, First, The arrangement of a repeating fire-arm, having a many-chambered cylinder hung upon a central axis, in such manner that the said cylinder shall revolve or oscillate between two given points, i. e., between the first and last chamber, substantially as set forth.

Second, Combining with an open frame, provided with a projecting stud, a cylinder movable upon its axis and grooved between two points of its circumference, so as to allow of its revolution or oscillation, as herein set forth.

Third, Providing the skeleton frame plate or retractor on the end of the sliding pin, when located in the rear of the cylinder, with ratchet teeth, in combination with a pawl actuated by the lock to operate the sliding pin together with the cylinder, as herein described.

Fourth, Holding the cylinder and sliding pin within the open frame of the arm by means of a hollow axle upon one end of the cylinder, in combination with a central socket at the other end thereof, and wrought into the skeleton frame of the sliding pin, together with a short movable pin fitting into the said socket, substantially as herein set forth.

Fifth, The combination with a cylinder held in the frame, as set forth, of a spring lever bearing the movable cylinder holding pin, under such an arrangement that the same may be operated from without, for the purpose of releasing the cylinder and enabling it to be disconnected from the hitcher stock of the arm.

Sixth, Combining with a cylinder held in its frame, as hereinbefore described, the method of mounting the frame, carrying the barrel and cylinder upon an axle, so as to allow of the disconnecting of the cylinder and barrel from the lock and stock by shifting the same sideways, as herein described.

48,776.—Lubricating Cups.—James Sangster, (assignor to Harvey Ball and Wm. H. Bonnell,) Buffalo, N. Y.:

I claim the brace, B, when constructed to operate as herein substantially set forth and described.

48,777.—Steam Engines.—Wm. Mont. Storm, (assignor to himself and R. Charlton Mitchell,) New York City:

First, I claim an engine constructed as follows, to wit: Of a cylinder containing two single acting pistons, rigidly connected by open "cross-heads," substantially as described, to the crank, both the latter (crank and crosshead) being located within the body of such cylinder and between its pistons, the whole being proportioned and arranged to this end, as set forth.

Second, I claim, in combination with the above, the superposed cylinder or engine, B, to act upon a crank parallel to the first and on the same shaft, also, through the mediation of a "crosshead" located in the same chamber, between the pistons of the horizontal cylinder, substantially in the manner and for the purposes described.

Third, I claim the arrangement whereby the stroke of the piston of such superposed engine is made considerably less than those of the horizontal one, so that the length of its "cross-head," as will be understood, may not render necessary an undue separation of the horizontal pistons, thus occupying unnecessary space, while the combined action of the whole device obviates a dead point, etc.

Fourth, I claim making the pistons of the horizontal cylinder with an overhang, for the purpose described.

Fifth, I claim the pin, d, projecting longitudinally with, but eccentric to the shaft, and rotating with it, to operate the valve by fitting slots, X X', in their tails, at right angles to the lines of their motion, all as explained.

Sixth, I claim the combination of the parts, e f, h i', j 1, constituting the reversing gear, as described.

48,778.—Measuring Faucet.—Shephard H. Wheeler, (assignor to Richard Hedden, James T. Stillwell, C. T. Lee, Thomas J. Martin, A. G. Townsend, James Sullivan, Daniel Henderson and S. H. Wheeler,) Dowagiac, Mich.:

I claim, First, The adjustable cap, g, and thimble, f, in combination with the valve, d, for tightly closing the discharge orifice, a, of the faucet tube, substantially as described.

Second, The valve chamber, b, provided with a valve, d, which is acted upon by a spring, e, in combination with a reciprocating valve-piston, D, and the tube, A, substantially as described.

Third, The combination of tube, A, piston, D, valve chamber, b, and nozzle, C, constructed and operating substantially as described.

48,779.—Machine for Skinning Vegetables.—Oscar Hase, Mecklenburg Schwerin, Germany:

I claim the combination in a vegetable or fruit skinner of a stationary cylinder, having an internal roughened surface, with a rotating roughened disk, to impart centrifugal motion to the commodities to be skinned, substantially in the manner described.

48,780.—Transmitting Motion.—Edward Wadhams, (assignor to Edward Robert Kent,) Hamilton, Canada West:

I claim the double segmental rack, A, on the rock shaft, C, in combination with pinions, b b', ratchet wheels, d d', and pawls, e e', said ratchet wheels being keyed to the shaft, D, substantially as and for the purpose set forth.

[The object of this invention is to transmit motion from an oscillating or rock shaft to another revolving shaft, or, in other words, to convert the oscillating motion of one shaft in a continuous revolving motion of another shaft.]

REISSUES.

2,026.—Curtain Fixture.—Edward T. Briggs, Boston, Mass. Patented May 19, 1863:

I claim the combination composed of the tubular curtain roller, A', its stationary shaft, a, and helical spring, e, as set forth, and a friction apparatus (substantially as described), or its equivalent, for the purpose or to operate as set forth, the whole being for application to a shade and a weighted tassel, and co-operative, as explained.

I also claim the combination of the nut, E, and the screw, c, with the shaft, a, the roller, A', and its spring, e, they being arranged and applied as described, and the purpose of such screw and nut, irrespective of their use with the remainder of the friction apparatus, being to prevent the spring from unwinding further than is necessary to cause the roller to wind up the shade.

I also claim the friction apparatus constructed or composed of the screw, c, the disk, F, the nut, E, the spring, i, and the nut, H, and arranged with the roller, A', and its shaft, a, so as to operate therewith substantially as set forth.

2,027.—Truck for Street Railways.—Robert H. Lecky, Allegheny, Pa. Patented April 5, 1864:

First, I claim arranging the axles with relation to the wheels so that the inner end of the axles of the wheels which travel on the short or inner curve of the track will, in turning curves, move more than the inner end of the axles of the wheels which travel on the long or outer curve of the track, said axles and wheels being operated substantially in the manner and by the means herein described and for the purpose set forth.

Second, The combination of the swivel bearings, 6 and 20, with the disks, m (or their equivalents—levers), axles, l, wheels, i, and connecting rod, 19, operated by the means and in the manner substantially as described, for the purpose set forth.

Third, Securing the tongue, a', to the bottom, b, by means of the flanged tube, x', and support, x, as herein described and for the purpose set forth.

Fourth, The use of the catch, 17, and guide, q, when used in combination with the tongue, a', flanged tube, x', bottom, b, and lever, b', arranged and operating substantially as herein described and for the purpose set forth.

Fifth, The arrangement of the brakes, z, cups, w, plungers, v, and levers, 9 8 18 and 12, arranged and operating substantially as herein described for the purpose set forth.

EXTENSIONS.

Lanterns.—Hugh and James Sangster, Buffalo, N. Y. Patented June 10, 1851. Reissued Aug. 21, 1855. Extended June 8, 1865:

We claim constructing and arranging the spring catches, I, in the manner described or its equivalent, to cause the attachment of the lamp to the lantern by the operation of pressing the lantern down upon the spring catches.

Also arranging the thumb pieces, L, within the flange, G, at the base of the lamp by extending the springs, I, towards each other horizontally as described, and thus forming the elbow catch to rest against the shoulder of the flange, E, of the lantern in the manner and for the purposes specified.

Regulaters for the Pen Beam in Ruling Machines.—W. O. Hickok, Harrisburg, Pa. Patented June 17, 1851. Extended June 14, 1865:

First, I claim the pieces, G H A B, in combination with the hinge-joints, 1 2 3, arranged and combined substantially and for the purpose as herein described

Second, I claim the sliding piece, B, the bearings, C C C, and the finger wheel, F, in combination with the pieces, G H A, uniting by hinge joints, or in any other manner, substantially the same; using in the construction of the whole machine any material adapted to the purpose of forming, as herein described, a pen beam regulator, for ruling machines.

Printing names of Subscribers upon Newspapers, Etc.—Henry Moeser, Pittsburgh, Pa. Patented June 24, 1851. Extended June 14, 1865:

I claim the arrangement and construction of a machine for printing names of persons or places on newspapers and other papers after the manner substantially as described, viz. of a form containing the column of names to be printed, set up in types, and being brought under the action of a stamp by means of a slide, moving by degrees; together with the application of a slitted plate, allowing the paper to be printed to be pressed down on the line, right beneath the slit of the plate, and shielding the paper from the lines, adjoining that under action of the stamp, as herein before described.

Railroad Car.—Lawrence Myers, Philadelphia, Pa. Patented June 24, 1851. Reissued March 21, 1865. Extended June 16, 1865:

I claim, First, The combination substantially as described, of a hollow vessel with flanged wheels or tires adapted to the rails of a railroad for the purpose specified.

Second, One or more partitions combined with the said hollow vessel, substantially as and for the purpose described.

Machinery for Cutting Files.—John Crum, Ramapo, N. Y. Patented July 1, 1851. Extended June 24, 1865:

I claim connecting the file blank to be cut with a bed, which has a positive feed motion, substantially as described, in combination with an incidental rolling motion depending upon the shape of the blank and the angle which the cutter forms therewith, substantially as described.

I also claim connecting the chisel with its stock by a joint, as described, in combination with a rolling bed, as described, by which they are rendered self-adapting, as described.

I also claim holding the file down on to the bed during the operation of cutting, by means of a roller, or its equivalent, combined with the rolling bed, substantially as herein described, but this I only claim when the end of the file is so connected with its bed that it shall be free to move up and down that the pressure of the roller may keep that part of the file that is being cut firmly down on to the bed, as herein specified.

Portable Hydraulic Press.—Richard Dudgeon, New York City. Patented July 8, 1851. Extended June 23, 1865:

I claim a hydraulic press, quite portable, in which the ram is hollow, and serves as the reservoir to supply the cylinder with water or other liquid, while the force pump and its appendages are contained within the ram, so that by working this force pump the ram is forced up until the liquid in such ram is exhausted, and by moving the handle of the pump down it will come in contact with a rod attached to a valve in the pump piston, and the latter comes in contact with a valve in the end of the ram, opening them both, and allowing the water to return into the ram again through passages.

Harvester.—(A.)—Aaron Palmer, Brockport, N. Y., and Stephen G. Williams, Janesville, Wis. Patented July 1, 1851. Reissued April 10, 1855. Again reissued Jan. 1, 1861. Extended June 29, 1865:

We claim discharging the cut grain from a quadrant-shaped platform, on which it falls as it is cut, by means of an automatic sweep rake, sweeping over the same, substantially as described

Harvester.—(B.)—Aaron Palmer, Brockport, N. Y., and Stephen G. Williams, Janesville, Wis. Patented July 1, 1851. Reissued April 10, 1855. Reissued Jan. 1, 1861. Again reissued May 31, 1864. Extended June 29, 1865:

We claim the combination of the cutting apparatus of a harvesting machine with a quadrant-shaped platform, arranged in the rear thereof, and a sweep rake operated by mechanism, in such manner that its teeth are caused to sweep over the platform in curves when acting on the grain, these parts being and operating substantially as hereinbefore set forth.

We also claim the combination of a quadrant-shaped platform, a sweep rake operated by mechanism, which causes the rake to move in alternately opposite directions, an inclined rail to raise the rake, and a switch, these parts being and operating substantially as hereinbefore set forth.

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[See Judge Holt's letter on another page.]

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THE AMERICAN INSTITUTE HAVING ENGAGED the spacious Armory on Fourteenth street, in the City of New York, will hold their 36th Annual Fair from the 12th day of September to the 19th of October next. Articles for Exhibition will be received from the 6th to the 12th of September. The exhibition will consist solely of American Inventions, Machinery and Manufactures and Agricultural and Horticultural Productions. The time for a reunion of American Inventors, Manufacturers and Agriculturists was never more appropriate than the present. The American People, after vindicating their nationality and demonstrating the importance and magnitude of their Mechanical and Agricultural Resources, enter now upon a new career, when it becomes alike the duty and interest of every citizen to promote the reward of American Ingenuity and the encouragement of American Manufactures and Productions. Individuals and Companies engaged in these industries are invited to co-operate by contributing for exhibition the product of their skill and industry, thereby promoting and advancing the material prosperity of the country. Every indication promises to make this exhibition one of the grandest and most varied ever held in this country, while the managers are determined to use every effort toward the accomplishment of such a result. Machinery in motion will constitute the great feature of the Fair, and steam power will be provided. Premiums of Gold, Silver and Bronze Medals and Diplomas will, by competent and impartial judges, be awarded to those exhibitors whose articles shall be adjudged most meritorious. Special Premiums of Gold and Silver Medals, and Silver Cups and Plate will be awarded on such articles as are set forth in the circulars issued by the Board of Managers. All correspondence must be directed to Prof. S. D. TILLMAN, Sec. American Institute, New York City, and articles for exhibition to JOHN W. CHAMBERS, Clerk of American Institute, Armory 14th street, New York City, freight prepaid. 4 3 & 2eow

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THE EIGHTEENTH ANNUAL EXHIBITION OF THE Maryland Institute of Baltimore, for the Mechanic Arts, will commence on Monday Evening, the 2d of October, and continue to Monday Evening, the 30th of October, 1865.

The hall will be open for the reception of goods on Monday, the 25th of September.

Goods for Competition and Premium must be deposited before Thursday Night, the 28th of September.

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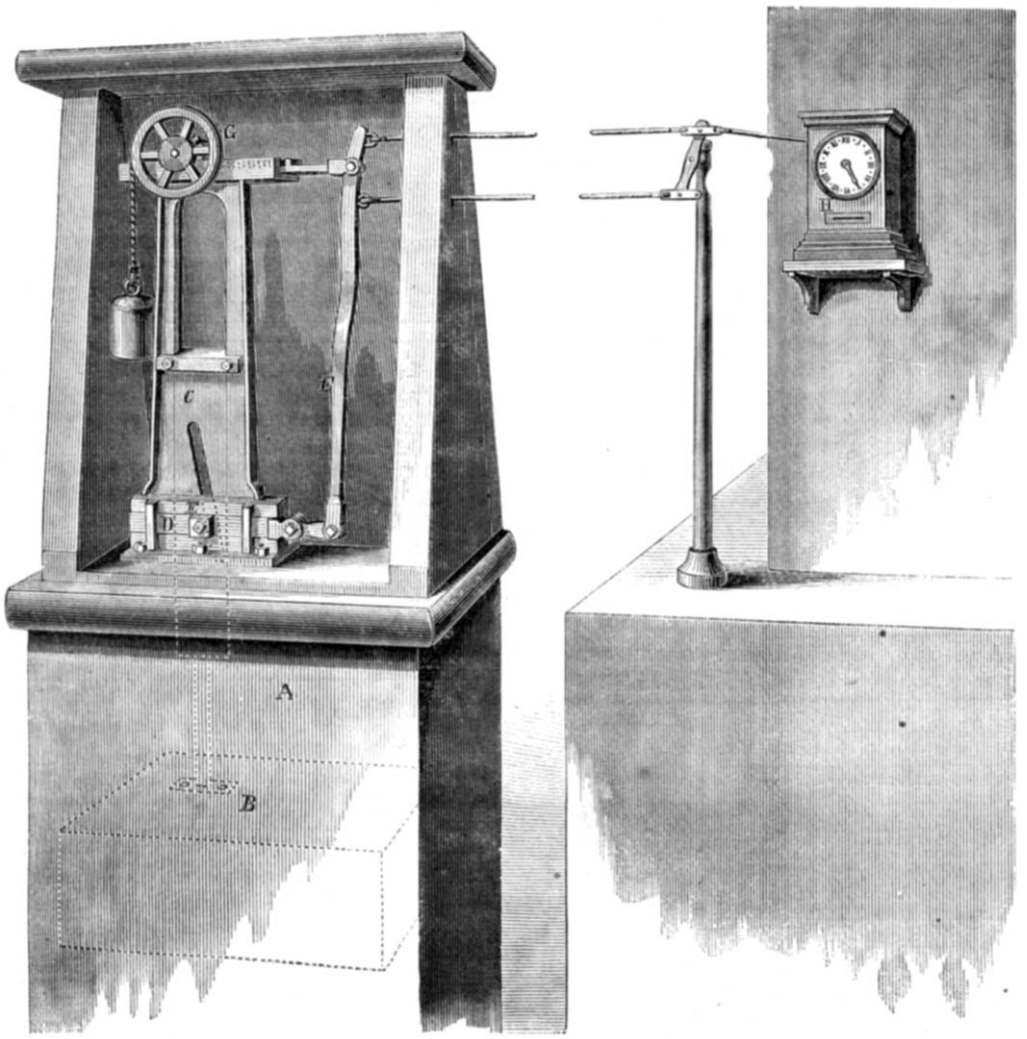
Improved Indicator for Streams.

This invention is designed to indicate the hight of water in streams or flumes, and give notice immediately of any dangerous increase, so that injury to dams can be foreseen and prevented. It also indicates loss of water from any cause, and strikes an alarm bell to call attention to the derangement, whatever it may be. The apparatus may be placed in the house or the mill; in the first instance the necessity for going out doors is obviated. The details are as follows:—

The case, A, contains a float, B, which has a cross-head, C. This cross-head works between guides and has a slot in it which moves a bar, D, by a pin, E, placed therein. The bar is connected to a long lever, F, which, in common with a sliding rack and weighted wheel, G, causes the index hand on the dial, H, to move around, through the action of the levers aforesaid, and at the same time liberate an alarm bell to inform persons in the vicinity that a change is taking place.

This instrument can be used, we are informed, in shoal or deep water, and is valuable to pilots, millers and all other parties interested in the matters it professes to control.

It was patented through the Scientific American Patent Agency, Nov. 8, 1864, by R. D. Bradley, of Preston, Md.; address him as above for further information.



BRADLEY'S INDICATOR FOR STREAMS.

Singular Freak of a Lunatic.

Has any one noticed the miniature fort at the top of Blackwell's Island to the north of the Lunatic Asylum? It is the work of an insane man, who has spent half his life upon it. He lost his mind in Mexico, or somewhere else where high privates were in demand, and just escaped being Mr. Armstrong, or Mr. Parrot, or Mr. Whitworth, by going crazy.

Gunnery was what ailed him—and fortification. As he was found to be quite hopeless, and obedient to his monomania, they gave him intrenching tools and told him to fortify the island. He took the geographical and geological bearings with the accuracy of a West Pointer and concluded that any attack upon it would come from the Sound. So he devised a sea-coast battery with bomb proof, approached by a dike with sluices and gates, and mounting heavy ordnance.

There never was a more patient worker for humanity or patriotism than this poor addled head. Nobody else being insane upon the same point he could get no assistance. All the other monomaniacs had oil on the brain, or poetry, or capital punishment, or negro suffrage, and were quite as devoted and zealous as he upon their several claims.

So the old soldier, with a long sigh and a brave heart, took up his single shovel and commenced to build the whole fort by himself. He wheeled barrow after barrow of earth into the sea, tugging from morning till night, until at last he raised a narrow causeway from the main land to a rock at the end of a long sand bar. With pebbles and shells and stones from the river, he walled this causeway until it became permanent. All this was not a month's or a year's work; year after year passed over his gray hairs, but he kept on wheeling, wheeling. The great city, on the greater island required protection, and he was making its ægis. So he went on like the men who threw up the Charleston redoubts, and for fear that he might be late to his task he left his bed in the asylum altogether and built himself a hut close to his place of labor. Here he slept and dwelt, in the company only of his assuring conscience; and when at last his path was done, he set to work at his fort.

The result of all these years is before us. His battery is sodded green, with parapet, berm, ditch, magazine, revetments, abattis, and it mounts mock or Quaker guns, upon carriages of capital construction, looking up from the sound towards Hell Gate, like real arbiters of dominion.

The old lunatic is worn and failing, but he is not satisfied. His fort is done, but not his whole duty. So he has projected a water battery and sea-wall around the entire island, and meansto bring to bear upon it all the knowledge of Vauban and Todleben. When the Island is impregnable he will wrap his mantle about him and die at his battery.

For the truth of all this story let anybody passing up the East river look upon the island tip, and see an old man ditching and building, and the little fort close by him bristling with pop-guns.

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